Revised Watershed Plan and Environmental Assessment

NRCS Natural Resources Conservation Service

Tobesofkee Creek Watershed

Lamar and Monroe Counties, Georgia

September 2003

Watershed Plan - Environmental Assessment
for
Tobesofkee Creek Watershed, Georgia

Prepared for:
Lamar County Soil and Water Conservation District
Towaliga Soil and Water Conservation District

Prepare by:
United States Department of Agriculture,
Natural Resources Conservation Service

In Cooperation With:
Georgia Environmental Protection Division, Water Protection Branch
Georgia Forestry Commission
Georgia Rural Water Association
Georgia Soil and Water Conservation Commission
Georgia Wildlife Resources Division
The University of Georgia, Cooperative Extension Service
U.S. Fish and Wildlife Service
USDA-Farm Services Agency

Project Location:
Lamar and Monroe Counties, Georgia

For More Information:
Mr. Leonard Jordan
State Conservationist
USDA-Natural Resources Conservation Service
355 East Hancock Avenue
Athens, Georgia
706/546-2272

Watershed Plan - Environmental Assessment
for
Tobesofkee Creek Watershed, Georgia

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WATERSHED AGREEMENT

between the

LAMAR COUNTY SOIL AND WATER CONSERVATION DISTRICT
TOWALIGA SOIL AND WATER CONSERVATION DISTRICT

STATE OF GEORGIA
(Referred to herein as Sponsor)

and the

NATURAL RESOURCES CONSERVATION SERVICE

UNITED STATES DEPARTMENT OF AGRICULTURE

(Referred to herein as NRCS)

WHEREAS, application has heretofore been made to the Secretary of Agriculture by the Sponsor for assistance in preparing a plan for works of improvement for the Tobesofkee Creek Watershed, State of Georgia, under the authority of the Watershed Protection and Flood Prevention Act (16 U.S.C.1001-1008); and

WHEREAS, the responsibility for administration of the Watershed Protection and Flood Prevention Act, as amended, has been assigned by the Secretary of Agriculture to NRCS; and

WHEREAS, there has been developed through the cooperative efforts of the Sponsor and NRCS a plan for works of improvement for the Tobesofkee Creek Watershed, State of Georgia, hereinafter referred to as the watershed plan, which plan is annexed to and made a part of this agreement;

NOW, therefore, in view of the foregoing considerations, the Secretary of Agriculture, through NRCS, and the Sponsor hereby agree on the plan and that the works of improvement for this project will be installed, operated, and maintained in accordance with the terms, conditions, and stipulations provided for in this watershed plan and including the following:

1. The cost-sharing rate for the establishment of enduring land treatment practices is 75 percent of the eligible permanent practices. Establishment of enduring land treatment practices is 75 percent of the average cost. The estimated total financial assistance cost for enduring practices is $1,668,424.

2. The NRCS will assist the Sponsor in providing technical assistance to landowners or operators to plan and install land treatment practices shown in the watershed plan. Percentages of technical assistance costs are as follows:

Works of Improvement	Sponsor (percent)	NRCS (percent)	Estimated Technical Assistance Cost (dollars)
Technical Assistance	25	75	333,685

3. The Sponsor will obtain applications from owners of not less than 20 percent of the land in the problem area, indicating that they will carry out the planned treatment measures. These applications will be obtained before the first long-term land treatment contract is executed.

4. The Sponsor will obtain cooperative agreements with landowners or operators to operate and maintain the land treatment practices for the protection and improvement of the watershed.

5. The Sponsor and NRCS will each bear the cost of project administration that each incurs, estimated to be $22,246 and $66,737 respectively.

6. The costs shown in the plan are preliminary estimates. Final costs to be borne by the parties hereto, will be the average costs incurred in the installation of works of improvement or an approved variation.

7. This agreement is not a fund-obligating document. Financial and other assistance to be furnished by NRCS in carrying out the watershed plan is contingent upon the fulfillment of applicable laws and regulations and the availability of appropriations for this purpose.

8. A separate agreement will be entered into between NRCS and The Sponsor before either party initiate's work involving funds of the other party. Such agreements will set forth in detail the financial and working arrangements and other conditions that are applicable to the specific works of improvement.

9. The plan may be amended or revised only by mutual agreement of the parties hereto, except that NRCS may deauthorize or terminate funding at any time it determines that the Sponsor has failed to comply with the conditions of this agreement. In this case, NRCS shall promptly notify the Sponsor in writing of the determination and the reasons for the deauthorization of project funding, together with the effective date. Payments made to the Sponsor or recoveries by NRCS shall be in accord with the legal rights and liabilities of the parties when project funding has been deauthorized. An amendment to incorporate changes affecting a specific measure may be made by mutual agreement between NRCS and the Sponsors having specific responsibilities for the measures involved.

10. Activities conducted under this agreements will be in compliance with nondiscrimination provisions as contained in Titles VI and VII of the Civil Rights Act of 1964, as amended, the Civil Rights Restoration Act of 1987(Public law 100-259) and other nondiscrimination statues, namely, section 504 of the Rehabilitation Act of 1973, Title IX of the Education Amendments of 1972, The Age Discrimination Act of 1975,and in accordance with regulations of the Secretary of Agriculture(7 CFR. 15, Subparts A&B) which provide that no person

in the United States shall, on the grounds of race, color, national origin, eligion, sex, age, marital status or handicap, be excluded from participation in, be denied the benefits of, or otherwise be subjected to discrimination under any program or activity receiving Federal financial assistance from the Department of Agriculture or any agency thereof.

11. Certification Regarding Drug-Free Workplace Requirements (7 CFR 3017, Subpart F).

By signing this watershed agreement, the Sponsor is providing The certification set out below. If it is later determined that the Sponsors knowingly rendered a false certification, or otherwise violated the requirements of the Drug-Free Workplace Act, the NRCS, in addition to any other remedies available to the Federal Government, may take action authorized under the Drug-Free Workplace Act.

Controlled substance means a controlled substance in Schedules I through V of the Controlled Substances Act (21 U.S.C. 812) and as further defined by regulation (21 CFR 1308.11 through (308.15);

Conviction means a finding of (including a plea of nolo contendere) or imposition of sentence, or both, by any judicial body charged with the responsibility to determine violations of the Federal or State criminal drug statues;

Criminal drug statute means a Federal or non-Federal criminal statute involving the manufacturing, distribution, dispensing, use, or possession of any controlled substance;

Employee means the employee of a grantee directly engaged in the performance of work under a grant, including: (i) all direct charge employees; (ii) all indirect charge employees unless their impact or involvement is insignificant to the performance of the grant; and, (iii) temporary personnel and consultants who are directly engaged in the performance of work under the grant and who are on the grantee's payroll. This definition does not include workers not on the payroll of the grantee (e.g., volunteers, even if used to meet a matching requirement; consultants or independent contractors not on the grantees' payroll; or employees of subrecipients or subcontractors in covered workplaces).

Certification:

A. The Sponsor certifies they will continue to provide a drug-free workplace by:

(1) Publishing a statement notifying employees that the unlawful manufacture, distribution, dispensing, possession, or use of a controlled substance is prohibited in the grantee's workplace and specifying the actions that will be taken against employees for violation of such prohibition;

(2) Establishing an ongoing drug-free awareness program to inform employees about --

(a) The danger of drug abuse in the workplace;

The grantee's policy of maintaining a drug-free workplace;

Any available drug counseling, rehabilitation, And employee assistance programs; and

The penalties that may be imposed upon employees for drug abuse violations occurring in the workplace;

(3) Making it a requirement that each employee to be engaged in the performance of the grant be given a copy of the statement required by paragraph (1);

(4) Notifying the employee in the statement required by paragraph (1) that, as a condition of employment under the grant, the employee will --

(a) Abide by the terms of the statement; and

Notify the employer in writing of his or her conviction --- for a violation of a criminal drug statute occurring in the workplace no later than five calendar days after such conviction;

(5) Notifying the NRCS in writing, within ten calendar days after receiving notice under paragraph (4) (b) from an employee or otherwise receiving actual notice of such conviction. Employers of convicted employees must provide notice, including position title, to every grant officer or other designee on whose grant activity the convicted employee was working, unless the Federal agency has designated a central point for the receipt of such notices. Notice shall include the identification number(s) of each affected grant;

(6) Taking one of the following actions, within 30 calendar days of receiving notice under paragraph (4) (b), with respect to any employee who is so convicted--

Taking appropriate personnel action against such an employee, up to and including termination, consistent with the requirements of the Rehabilitation Act of 1973, as amended; or

Requiring such employee to participate satisfactorily in a drug abuse assistance or rehabilitation program approved for such purposes by a Federal, State, or local health, law enforcement, or other appropriate agency; and

(7) Making a good faith effort to continue to maintain a drug-free workplace through implementation of paragraphs (1), (2), (3), (4), (5), and (6).

B. The Sponsor may provide a list of the site(s) for the performance of work done in connection with a specific project or other agreement.

C. Agencies shall keep the original of all disclosure reports in the official files of the agency.

12. Certification Regarding Lobbying (7 CFR 3018) (applicable if this agreement exceeds $100,000).

(1) The Sponsors certifies to the best of its knowledge and belief, that:

No Federal appropriated funds have been paid or will be paid, by or on behalf of the Sponsor, to any person for influencing or attempting to influence an officer or employee of an agency, Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form - LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

The Sponsor shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients shall certify and disclose accordingly.

(2) This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by Section 1352, Title 31, U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such failure.

13. Certification Regarding Debarment, Suspension, and Other Responsibility Matters - Primary Covered Transactions (7 CFR 3017).

The Sponsor certifies to the best of their knowledge and belief, that they and their principals:

Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal department or agency.

Have not within a three-year period preceding this proposal been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State, or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;

Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State, or local) with commission of any of the offenses enumerated in paragraph (1)(b) of this certification; and

Have not within a three-year period preceding this application/proposal had one or more public transactions (Federal, State, or local) terminated for cause or default.

(2) Where the primary Sponsor is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this agreement.

14. Clean Air and Water Certification

(Applicable if this agreement exceeds $100,000, or a facility to be used has been the subject of a conviction under the Clean Air Act (42 U.S.C. 1857c-8(c)(1) or the Federal Water Pollution Control Act (33 U.S.C. 1319 (c) and is listed by EPA, or is not otherwise exempt.)

The project sponsoring organization(s) signatory to this agreement certifies as follows:

a. Any facility to be utilized in the performance of this proposed agreement is _____, is not __X__ listed on the Environmental Protection Agency List of Violating Facilities.
b. To promptly notify the NRCS-State Administrative Officer prior to the signing of this agreement by NRCS, of the receipt of any communication from the Director, Office of Federal Activities, U.S. Environmental Protection Agency, indicating that any facility which is proposed for use under this agreement is under conisderation to be listed on the Environmental Protection Agency List of Violating Facilities.
c. To include substantially this certification, including this subparagraph (c), in every nonexempt subagreement.

CLEAN AIR AND WATER CLAUSE

(Applicable if this agreement exceeds $100,000, or a facility to be used has been the subject of a conviction under the Clean Air Act (42 U>S>C 1857c-8(c)(1) or the Federal Water Pollution Control Act (33 U>S>C> 1319 (c) and is listed by EPA, or is not otherwise exempt.)

A. The project sponsoring organization(s) signatory to this agreement agrees as follows:
    1. To comply with all the requirements of section 114 of the Clean Air Act as amended (42 U.S.C. 1857, et. seq., as amended by Public Law 91-604) and section 308 of the Federal Water Pollution Control Act (33 U.S.C. 1251 et. seq., as amended by Public Law 92-500), respectively, relating to inspection, monitoring, entry, reports, and information, as well as other requirements specified in section 114 and section 308 of the Air Act and the Water Act, issued thereunder before the signing of this agreement by NRCS.

    2. That no portion of the work required by this agreement will be performed in a facilities listed on the EPA List of Violating Facilities on the date when this agreement was signed by NRCS unless and until the EPA eliminates the name of such facility or facilities from such listing.

3. To use their best efforts to comply with clean air standards and clean water standards at the facilities in which the agreement is being performed.

4. To insert the substance of the provisions of this clause in any nonexempt subagreement, including this subparagraph A. (4).

B. The terms used in this clause have the following meanings:

1. The term “Air Act” meas the Clean Air Act, as amended (42 U.S.C. 1857, et. seq., as amended by Public Law 91-604).

2. The term “Water Act” means Federal Water Pollution Control Act, as amended (33 U.S.C. 1251 et. seq., as amended by Public Law 92-500),

3. The term “clean air standards” means any enforceable rules, regulations, guidelines, standards, limitations, orders, controls, prohibitions, or other requirements which are contained in, issued under, or otherwise adopted pursuant to the Air Act or Executive Order 11738, an applicable implementation plan as described in section 110(d) of the Clean Air Act (42 U.S.C. 1857c –5(d)), and approved implementation procedure or plan under section 111 (c) or section 111(d), respectively, of the Air Act (42 U.S.C. 1857c-6(c) or (d), or an approved implementation procedure under section 112(d) of the Air Act (42 U.S.C. 1857c-7(d).

4. The term “clean water standards” means any enforceable limitation, control, condition, prohibition, standards, or other requirement with is promulgated pursuant to the Water Act or contained in a permit issued to a discharger by the Environmental Protection Agency or by a State under an approved program, as authorized by section 402 of the Water Act (33 U.S.C. 1342), or by a local government to ensure compliance with pretreatment regulations as required by section 307 of the Water Act (3 U.S.C. 1317).

5. The term “facility” means any building, plan, installation, structure, mine, vessel, or other floating craft, location or site of operations, owned, leased, or supervised by a sponsor, to be utilized in the performance of an agreement or subagreement. Where a location or site of operations contains or includes more than one building, plan, installation, or structure, the entire location shall be deemed to be a facility except where the Director, Office of Federal Activities, Environmental Protection Agency, determines that independent facilities are collocated in one geographical area.

15. Assurances and Compliance

As a condition the grant or cooperative agreement, th erecipient assures and certifies that it is in compliance iwht and will compy in the course of the agreement with all applicable laws, regulations, Executive Orders and other generally applicable requirements, including those set out below which are hereby incorporated in this

agreement by reference, and such other statutory provisions as a specifically set forth herein.

State and Local Governments: OMB Circular Nos. A-87, A-102, A-129, and A-133; and 7CFR Parts 3015, 3016, 3017, 3018, and 3052.

Educational Institutions: OMB Circular Nos. A-21, A-110, and A-129; and 7CFR Parts 3015, 3016, 3017, 3018, and 3019.

Indian Tribal Governments: OMB Circular Nos. A-87, A-102, and A-129; and 7CFR Parts 3015, 3016, 3017, 3018, and 3052.

Non-Profit Organizations, Hospitals, Institutions of Higher Learning: OMB Circular Nos. A-110, A-122, A-129, and A-133; and 7CFR Parts 3015, 3016, 3017, 3018, 3019, and 3052.

16. Examination of Records

Give the Service or the Comptroller General, through any authorized representative, access to and the right to examine all records, books, papers, or documents related to this agreement. Retain all records related to this agreement for a period of three years after completion of the terms of this agreement in accordance with the applicable OMB Circular.

LAMAR COUNTY SOIL AND WATER CONSERVATION DISTRICT, GA.

The signing of this plan was authorized by a resolution of the governing body of the Lamar County Soil and Water Conservation District adopted at a meeting held on _____ [Date].

By _____ _____

Title District Chairman Title: Secretary

Date _____ Date _____

_____ _____
Address Address

TOWALIGA SOIL AND WATER CONSERVATION DISTRICT, GA.

The signing of this plan was authorized by a resolution of the governing body of the Towaliga Soil and Water Conservation District adopted at a meeting held on _____ [Date].

By _____ _____

Title District Chairman Title: Secretary

Date _____ Date _____

_____ _____

NATURAL RESOURCES CONSERVATION SERVICE
UNITED STATES DEPARTMENT OF AGRICULTURE

Approved by:

_____
Leonard Jordan
State Conservationist

Date: _____

Revised Watershed Plan - Environmental Assessment
for
Tobesofkee Creek Watershed, Georgia

SUMMARY OF WATERSHED PLAN

Project Name: Tobesofkee Creek Watershed

Counties: Lamar and Monroe

State: Georgia

Sponsors: Lamar County Soil and Water Conservation District, GA
Towaliga Soil and Water Conservation District, GA

Description of Recommended Plan:
The Recommended Plan will consist of installing land treatment measures on approximately 13,797 acres of eroding pasture and cropland. Conservation measures will include, but not be limited to, conservation cover and cropping rotations; critical area planting; field borders; filter strips; grassed waterways; nutrient, pest, and residue management; riparian forest buffers; streambank protection; and terraces.

With respect to animal operations, the Recommended Plan will consist of installing 38 animal waste management systems. Each animal waste management system will include all or parts of the following components: waste treatment lagoon or pond, pump and concrete pad with stationary delivery pipe (waste utilization system), pasture and hayland planting with cross fencing and alternative livestock water supply, fencing, heavy use area protection, flush down system, diversions/curbing, stream crossings, manure scraper, riparian forested buffers, waste storage facilities with gutters, manure spreader and composting facilities.

Resource Information:
Tobesofkee Creek Watershed – Land Cover

Land Cover	Acres
Cropland	9,630
Pasture	24,677
Grazed Woodland	5,732
Hayland	6,566
Forest	48,866
Wetlands	2,825
Open Water	680
Urban	2,817
Other Lands	273
TOTAL	102,076

Land Ownership - **100% private, 0% public**
Number of Farms - **97**
Average Farm Size - **201 Acres**
Prime and Important Farm Land - **27,355 Acres**
Wetlands - **2,825 Acres**
Flood Plains -**10,003 Acres**
Highly Erodible Cropland – **8,667 Acres**
No. Minority Producers - **7**
No. Limited Resource Operators - **3**

Project Beneficiaries:
The watershed is oriented primarily to the production of agricultural and timber products. There are recreational opportunities, in the form of hunting and fishing, regularly enjoyed within the watershed; and camping, fishing, boating, and skiing occur regularly on Lake Tobesofkee just downstream of the watershed project area. Lake Tobesofkee provides a setting that has attracted housing developments adjacent to the reservoir. As such, agricultural producers within the watershed; fishermen, boaters, skiers, and local businesses; along with property owners in local proximity to the watershed are the primary beneficiaries of this project. Barnesville and Forsyth are the larger towns in the watershed with populations of 5,249 and 4,267 respectively. Many family farm units contain a dairy, beef or poultry operation with its supporting crops such as corn, soybeans, cotton, and vegetables. Per capita income in the project area average $16,732 compared to $25,839 for the state and $27,203 for the nation.

Threatened and Endangered Species:
There are 3 species of animals and 2 plants in Georgia that occur on the Federal List of Threatened and Endangered (T&E) Species and are known to be present in the watershed area.

Cultural Resources:
There are 12 listings on the Historic Register in the watershed. These include the Barnesville Depot, Carnegie Library of Barnesville, Lamar County Courthouse, Redbone Community Clubhouse [location of public meetings for watershed planning], U.S. Post Office – Barnesville, Forsyth Commercial Historic District, Front Circle, Tift College, Great Hill Place, Hil'Ardin/Shar-Hardin-Wright House, Monroe County Courthouse, and Montpelier Female Institute. Historic and prehistoric artifacts have been found throughout the watershed project area.

Problem Identification:
The Tobesofkee Creek Watershed has been identified by local work groups; by the Georgia Wildlife Resources Division; by the Georgia Environmental Protection Division; and by the US Department of Agriculture-Natural Resources Conservation Service [NRCS] as having significant natural resources concerns. The number and diversity of aquatic wildlife species and their habitats are considered as fair to poor. Tributaries within the watershed are impaired by excessive sediments and nutrients carried by sediments. While developing a Total Maximum Daily Load [pollutant load limitation] for streams within the watershed, the Georgia Environmental Protection Division estimated that over 85 percent of water quality impairments within the watershed stem from agricultural related activities. Left unchecked continued excessive erosion and sedimentation will accelerate the decline in the number and diversity of aquatic species and their habitats. Continued erosion and sedimentation will also diminish land productivity, reduce recreational opportunities, have a negative impact on real estate values, increase the cost of drinking water for urban areas, and reduce the water storage capacity of water supply reservoirs.

Landowners and other interested individuals in the watershed participated in identifying natural resource concerns. Their concerns included poor water quality, sedimentation in streams and ponds, inadequate supplies of good quality water for livestock, excessive cropland erosion, and poor pasture quality. They also expressed the need to protect prime farmland and wetlands, to maintain or improve human health and safety, and to enhance the local economy.

An interagency interdisciplinary team, led by NRCS, determined that a major contributor of these problems were livestock operations operating without adequate land treatment measures on pasture and cropland, and without adequate waste management systems. Sediment is causing significant damages (both economic and environmental) to land and related water resources within, and downstream of, the watershed. Cropland and pasture erosion (142,978 tons/year) on 46,585 acres is reducing crop yields and forage productivity, and generating significant offsite sediment. An estimated 26 percent (37,174 tons) of the sediment is delivered to watershed wetlands, ponds, and streams. In addition, gullies and degrading stream banks are yielding another 50,213 tons/year of sediment in the watershed. It is estimated that 5 percent (10,389 tons/year) of the sediment reaches the watershed outlet and into Lake Tobesofkee annually. Sediment buildup in the Tobesofkee Creek and tributaries has caused several "islands" to form, reducing the drainage capacity, altering water flow, and increasing sedimentation off site. This adversely impacts recreational opportunities, real estate values, and aquatic habitats.

The interdisciplinary team also determined that approximately 33,469 tons of animal waste from 13 dairy operations, 139,318 tons of waste from 65 beef operations, 6,544 tons of waste from 4 poultry/breeder operations and 4,501 tons from one swine operation are being produced in the watershed each year. One concern associated with animal waste is the quantity of nutrients and bacteria being applied to pasture and cropland, and subsequently entering into the watershed stream system and flowing into Lake Tobesofkee. Bibb County, Georgia, owns and operates this lake as a major regional recreational reservoir. The amount of nutrients and bacteria in runoff from agricultural lands exceed Georgia Environmental Protection Division water quality standards and recommended limits established by the US Environmental Protection Agency. High concentrations of nutrients and bacteria in streams and lakes pose potential health risks.

Alternative Plans Considered:
In the formulation process, five alternative watershed plans were considered. A No Action Plan was identified, which includes continued use of the Environmental Quality Incentives Program [EQIP] and Conservation Reserve Program [CRP] activities directed toward improving water quality and enhancing environmental resources. Oter alternatives considered were a Minimum Action Plan, Moderate Action Plan, Resource Protection Plan [RP], and a Recommended Plan. The Minimum Action Plan consisted of 28 animal waste management systems and treatment on 10,350 acres of eroding cropland and pasture. The Moderate Action Plan consisted of 34 animal waste management systems plus land treatment of 10,950 acres of eroding pasture and cropland. The RP contained 54 animal waste management systems plus land treatment of 26,294 acres of eroding pasture and cropland. The Recommended Plan included 38 animal waste management systems plus land treatment of 13,797 acres of eroding pasture and cropland.

Project Purpose: Watershed Protection and Improvement of Water Quality.

Principal Project Measures:
The Recommended plan includes land treatment measures on approximately 13,797 acres of eroding pasture and cropland and proper utilization of animal waste using the following practices:

- conservation cover and cropping rotations
- critical area planting
- diversions/curbing
- fencing and cross fencing
- field borders
- filter strips
- grassed waterways
- heavy use area protection
- livestock water supply
- manure transfer nutrient management
- pasture and hayland planting
- pest management
- residue management
- riparian forest buffers
- streambank protection
- terraces
- compost facility
- stream crossings
- waste management system
- waste storage structure
- waste treatment lagoon or pond
- waste utilization system

Project Costs (Dollars):	PL-566 Funds	Other Funds	Total
Land Treatment	855,961	285,320	1,141,281
Animal Waste Mgt.	812,463	270,821	1,083,284
Technical Assistance	250,264	83,421	333,685
Project Administration	66,737	22.246	88,983
TOTAL	1,985,424	661,808	2,647,232

Monetary Benefits (Average Annual):

Agricultural Related: $354,288
Non-Agricultural Related: $ 592,329
Total Monetary Benefits: $ 946,617

Project Benefits: (Price Base 2002)

Non-Monetary Benefits:
The project will enhance the aesthetic and environmental quality of the watershed, the Tobesofkee Creek drainage area, and Lake Tobesofkee. Benefits to the area resources will be realized by improving water quality by reducing excessive sediments and nutrients. Wildlife habitats will be improved and odor from animal waste will be reduced. The potential for health and safety problems from impaired water quality will be reduced and the overall well-being and social feelings in the communities will improve.

Resource	**Impact**
Land Use Changes	**No Impact**
Wooded Flood Plains	**Positive Impact: Flood plain areas void of vegetation caused by roaming cattle will be managed and allowed to grow back in native riparian vegetation.**
Fisheries	**Positive Impact: Impaired fish habitats will decrease, allowing fish yields to increase.**
Wildlife Habitat	**Positive Impact – Impaired riparian wildlife habitats will be restored.**
Wetlands	**Positive Impact – Riparian buffers and decreased sedimentation will allow natural hydrologic process to begin a natural restoration process.**
Cultural Resources (No. & Type)	**No Impact**
Prime Farmland (Ac)	**No Impact**
Compensatory Mitigation:	**None**
Major Conclusions:	**(Final Statements)**
Areas of Controversy:	**(Final Statements)**
Issues to be Resolved:	**(Final Statements)**

INTRODUCTION

The Lamar County and Towaliga Soil and Water Conservation Districts in Georgia (Sponsor) requested assistance from The Natural Resources Conservation Service (NRCS) in developing a watershed protection plan for the Tobesofkee Creek Watershed (Figure 1, Page 20). Public Law 83-566 (PL-566) authorizes the NRCS to assist local sponsors in developing and carrying out such projects.

The plan also serves as a basis and justification for authorizing federal assistance to implement the watershed project. Financial assistance will be provided at the same rate as other similar federal cost share programs in the area (up to 75 percent), and will be used to complement farmer inputs and other cost share assistance programs. As such, this plan was developed following the NRCS Planning Process outlined in the NRCS-National Planning Procedures Handbook. It also conforms to the criteria established in the NRCS-National Watershed Manual, Economic and Environmental Principles and Guidelines, and other NRCS watershed planning policy. Among all alternatives considered, the Recommended Plan is the least cost environmentally acceptable alternative. The NRCS planning process contains provisions for public participation, technical analysis [i.e. water quality analysis], economic analysis, and a formal interagency review process. This plan serves as documentation of these provisions for the Tobesofkee Creek Watershed.

This watershed is comprised of five subwatersheds in the Ocmulgee River Basin (03070103). These include subwatersheds that are adversely impacting water quality in the Tobesofkee Creek drainage area, and also on Lake Tobesofkee, an important recreational resource for the region. None of the subwatersheds included in the project area have accelerated water quality and land treatment actions underway. This project is the key to long term recovery of this important regional resource. All information and data, except as otherwise noted, were collected during watershed planning investigations or were previously collected by USDA and other natural resource agencies.

This watershed protection plan addresses the regions soil, water, air, plant, and animal resources by protecting water quality, reducing offsite sedimentation damage, reducing nutrient and bacterial offsite transport, sustaining productivity of the soil resource base, and improving the social and economic resources in the area. The plan identifies land treatment practices and animal waste management systems necessary to address these concerns.

PROJECT SETTING

This section of the watershed plan and environmental assessment describes pertinent physical, social, and economic features of the Tobesofkee Creek Watershed. Some conditions within the watershed will be constant throughout the evaluated life of the project [i.e. physical features], while others will be subject to change because of social, economic, and political influences.

PHYSICAL FEATURES

1. Original Watershed Project

This watershed plan and environmental assessment represents a revision to a previous watershed plan for the Tobesofkee Creek Watershed. The original Tobesofkee Creek Watershed Project encompassed some 137,029 acres and plan was completed in November 1958 with supplemental changes dating to April 1964. Project implementation occurred from 1958 until 1976, when the project was considered to be completed. Excessive flooding and erosion, as well as the need for recreational facilities, were address in the original watershed plan. Planned measures included:

- Cover Cropping – 1,169 acres
- Critical Area Treatment – 607 acres
- Drainage Control – 1,168 acres
- Fire Control – 104,670 acres
- Floodwater Retarding Structures – 2
- Pasture Planting – 10,455 acres
- Ponds - 90
- Roadside Erosion Control – 11 miles
- Terraces – 140 miles
- Tree Planting – 8,590
- Water Supply/Recreation Structure - 1
- Waterway Development – 335 acres
- Wildlife Area Improvement – 380 acres

Two floodwater retarding structures, one water supply/recreational structure [Lake Tobesofkee], and 3,200 feet of channel improvement were installed as a result of the original watershed project. Records regarding the installation of other planned measures are less reliable.

The watershed has experienced some changes in the 45 years since the original watershed plan was completed. Agriculture has become more pronounced within the watershed accounting for 19 percent of the land use in 1958 and 38 percent of the land use in 2002. Residential development, along the shores of Lake Tobesofkee; and commercial development along Interstate 75 area are also new to the area since the original watershed plan was completed.

2. Current Project Location:

The current Tobesofkee Creek Watershed is located within the original watershed project boundaries in central Georgia in the Southern Piedmont Land Resource Area (MLRA 304). The Project area includes sub-watersheds 030701031401, 030701031402, 030701031403, 030701031404, and 030701031405; which are located in the Upper Ocmulgee River Basin. The total project area is 102,076 acres, which is 74.5 percent of the original watershed project area. Of this total, 26,604 acres are located in Lamar County, and 73,172 acres are located in Monroe County. There are an additional 2,300 acres in Bibb County, much of which includes the upper reaches of Lake Tobesofkee. A location map of the current watershed, and original watershed, location is displayed on page 19.

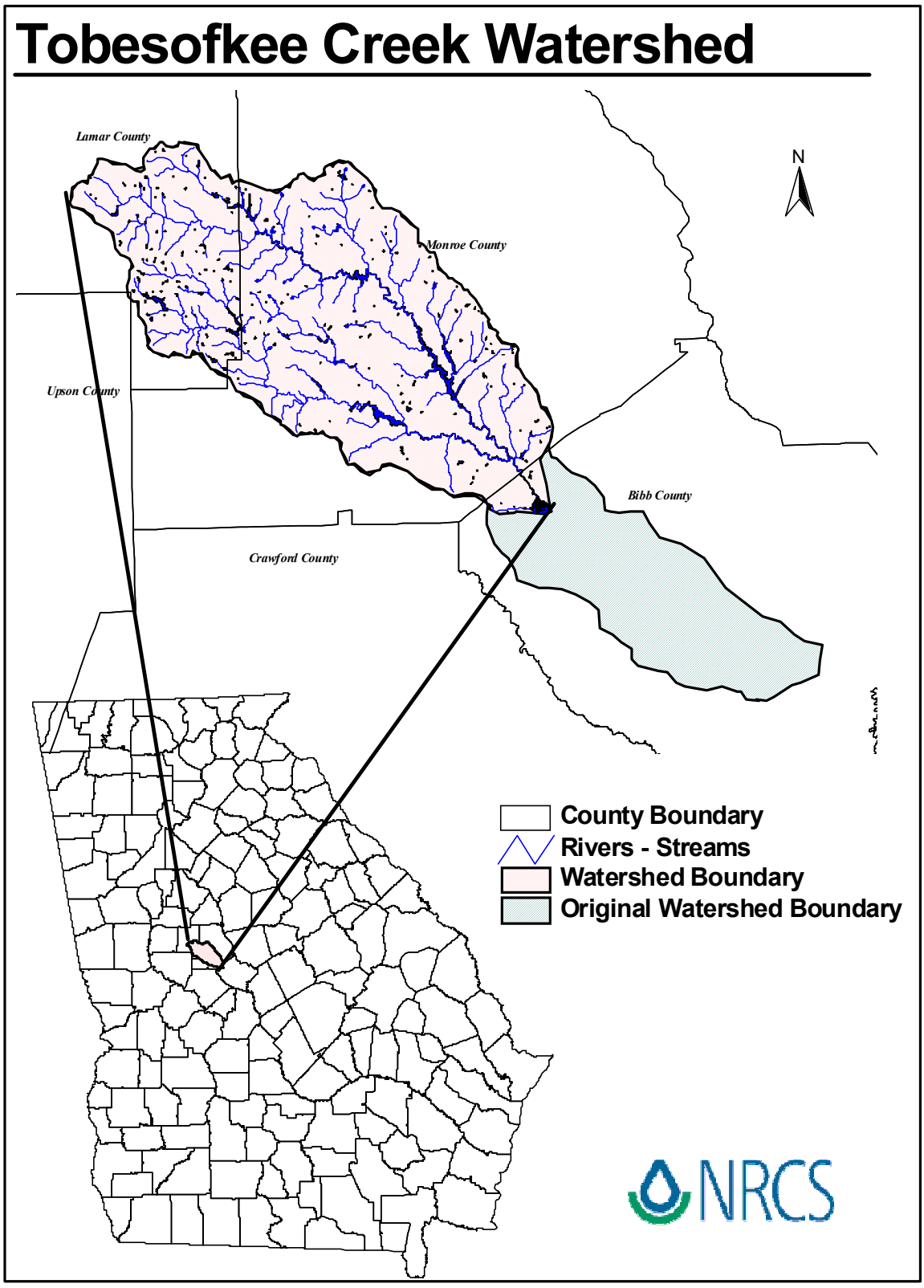
3. Streams, Lakes, and Wetlands

Streams - There are an estimated 244 miles of streams in the watershed. Main creeks include: Cole Creek, Little Tobesofkee Creek, Reedy Creek, Rock Branch, Tobesofkee Creek, Todd Creek, and Yellow Creek. Stream channels are fairly well defined in the perennial reaches; however, they are poorly defined in the intermittent reaches, which are often filled with sediment. All surface drainage from the watershed flows into Tobesofkee Creek and eventually into Lake Tobesofkee (see page 20). The effective drainage area of the Tobesofkee Creek watershed is 102,076 acres.

Lakes – There are 2,374 acres of constructed lakes and ponds within the watershed. The most prominent lakes include Lake Tobesofkee (1,750 surface acres) at the watershed terminus. Lake Tobesofkee serves as a vital regional recreational resource. The effective drainage area of Lake Tobesofkee is 115,944 acres, with the Tobesofkee Creek Watershed draining 88 percent of this total**.** The watershed contains a few natural ponds, bays, or beaver ponds and associated forested wetlands.

Wetlands - The wetlands along with streams and ponds are estimated at 2,825 acres. Most wetland acres are associated as forested wetlands. Approximately 10,003 acres are considered flood plains.

Figure 1. Location Map – Tobesofkee Creek Watershed.



4. Topography

The Tobesofkee Creek Watershed is approximately 23 miles in length with elevations ranging from 110 feet mean sea level (MSL) near the watershed terminus at Lake Tobesofkee to 300 feet MSL in the headwaters.

5. Climate

The climate of the watershed is humid and mild with long hot summers and cool short winters. Summer temperatures normally exceed 90 degrees F. and winter temperatures are rarely lower than 20 degrees F. The average annual temperature is 76 degrees F. Precipitation is fairly heavy throughout the year averaging 45 inches. The median number of growing days per year is 233. Last frost in the spring is generally between March 11 and March 31. First frost in the fall usually occurs between October 26 and November 18. It is normal to have more than 0.10 inch of rain per day 71 days out of the year.

6. Soils

An estimated 27,355 acres (27 percent) of the watershed soils are listed as prime farmland, of which 1,020 1% acres are land capability Class I. An estimated 93,808 acres (91.9 percent) are in land capability Subclass e, 1,429 acres (1.4 percent) in Subclass s, and 6,839 acres (6.7 percent) in Subclass w. The predominate upland soils are Appling, Cecil, Davidson, and Madison, while Buncombe, Chewacla, Starr, and Wehadkee are the predominate lowland soils

7. Geology

The watershed lies in the Southern Piedmont Physiographic Province of central Georgia underlain mostly by Precambrian and older Paleozoic crystalline rocks that include granites, mica schist, and biotite gneiss. Within this portion of the Southern Piedmont rock units are generally aligned to the northeast parallel to regional structures, while surface water flows are generally to the southeast. Important regional structures include the Towaliga Fault Zone at the headwaters, the Goat Rock Fault Zone approximately halfway through the watershed, and the Fall Line a few miles south of the watershed terminus.

8. Fish Habitat

Studies by Georgia Department of Natural Resources indicate the portions of the Tobesofkee Creek drainage are presently not fully supporting their designated use. However, area streams and lakes can support high populations of game fish with good quality water. There are stream habitats located in the watershed that support native reproducing of warmer water fish.

Lake Tobesofkee [1,750 acres] can also support a very large population of game fish. Fishing on the lake in the past has been one of the most popular recreational activities in the area.

There are 680 acres of water contained in streams, small lakes, farm ponds, and natural ponds. Fish populations in these water bodies depend on the degree of management and water quality. The primary fish species identified in the watershed were shiners, studfish, redhorse, bluegill, darters, and bass.

9. Wildlife Habitat

Many upland and wetland wildlife habitats occur within the watershed. Upland habitat types include upland hardwoods, mixed pine/hardwood, and early succession habitats [both native and exotic]. Wetland habitats occurring in the area include bottomland hardwoods, ephemeral wetlands, and perennial aquatic habitats such as streams, swamps, ponds, and lakes. Currently, the most productive and diverse habitat available to wildlife is bottomland hardwoods with associated perennial streams and swamps.

All three of Georgia's big game occur within the watershed. White-tailed deer are the most abundant, followed by wild turkey. There is an expanding black bear population in middle Georgia that uses this watershed with increasing frequency. Small game are prevalent and include squirrels, cottontail rabbits, mourning dove, bobwhite quail, and woodcock. Other harvestable game species occurring within the watershed are raccoon, crow, bobcat, opossum, foxes, and a variety of waterfowl. Wood ducks occur throughout the watershed and other waterfowl species are concentrated around larger lakes.

Nongame species of wildlife occurring throughout the watershed are also abundant. Upland and wetland habitats play host to a variety of migratory and resident songbirds. Common resident and seasonal species include mockingbird, cardinal, wood thrush, titmouse, summar tanager, bluebird, brown thrasher, song sparrow, white-crowned sparrow, and many types of warbler. In addition, these habitats support a variety reptiles and amphibians found throughout the watershed. In particular, riparian areas are very important during reproduction and serve to help these species regulate body temperature by providing share and wetlands.

10. Threatened and Endangered Species

There are 3 species of animals and 2 plants in Georgia that occur on the Federal List of Threatened and Endangered (T&E) Species and are known to be present in the watershed area, they are listed on page 41.

11. Cultural Resources, Natural and Scenic Areas, and Visual Resources

There are 12 listings on the Historic Register in the watershed. These include the Barnesville Depot, Carnegie Library of Barnesville, Lamar County Courthouse, Redbone Community Clubhouse [location of public meetings for watershed planning], U.S. Post Office – Barnesville, Culloden Historic District, Forsyth Commercial Historic District, Front Circle, Tift College, Great Hill Place, Hil'Ardin/Shar-Hardin-Wright House, Monroe County Courthouse, and Montpelier Female Institute. Historic and prehistoric artifacts are thought to be common in, and geographically distributed throughout, the project area.

Because participating in the NRCS Watershed Program is voluntary, and it is unknown which specific landowners will participate. Potential adverse impacts on cultural resources will be assessed on a field by field basis with participating landowners.

Visual appearance of the watershed is less than desirable due to erosion of the landscape and algal growth and organic scum on area ponds.

SOCIAL AND ECONOMIC CONDITIONS

1. Social Conditions

The University of Georgia reports there are 97 farms with revenues sufficient to warrant consideration as a full-time operation. Average size per farm is 201 acres. Approximately 75 percent of the farms are owner-operated. The other 25 percent are operated under lease arrangements. There are 7 minority landowners living in the watershed, exclusive of the urban areas. Most of the land in the watershed is under private ownership. Less than 20 percent of the farms are rented, and those that are rented have stable leases even if the lease is year-to-year.

Farmland ownership includes full time and part time agricultural producers. Conservation stewardship exists with the desire for farms to remain productive for future generations. However, the agricultural producers have requested additional technical and financial assistance in order to accelerate the implementation of conservation measures.

2. Economic Conditions

The economy of the watershed is oriented primarily to the production of agricultural products. Barnesville, Ga.; Forsyth, Ga.; the outer fringes of Macon, Ga.; and a few small towns are the only urbanized areas in the watershed. Barnesville and Forsyth have populations of 5,249 and 4,267 respectively. Per capita income in the project area averages $16,732 compared to $25,839 for the state and $27,203 for the nation.

3. Agricultural Economy:

Agricultural related operations provide an important economic stimulus to the area contributing over $13,038,135 annually to the local economy. However, to maintain this condition, actions need to be taken to reduce onsite and offsite effects of erosion and sedimentation. Current and potential animal waste problems have also been recognized in the watershed as needing to be addressed.

a. Crops - The major crops inventoried were corn, corn-silage, cotton, hay, wheat and miscellaneous crops such as vineyards and vegetables. Collectively, these commodities were valued at $1 million in the year 2000.

   Some 5 percent of the cropland is idle. Most of the idle acres were either in "set aside" programs or operators decided not to plant due to economics or weather conditions.

Table A. Crop acreage and average yields in Tobesofkee Creek Watershed.

Crop	Acres	Average Yield Non-Irrigated
Corn	744	80 bushels/acre
Cotton	409	525 pounds/acre
Hay	2,258	4 tons/acre
Sorghum	69	75 bushels/acre
Soybeans	76	80 bushels/acre
Wheat	548	40 bushels/acre
Fruits and Vegetables	141	
Other	5,385	
Total	9,630	

Source: USDA-Natural Resources Conservation Service

b. Livestock - A total of 1,500 dairy cows and 12,600 beef cattle exist in the watershed contribute $3.2 million annual to the watershed's economy. The average size of each dairy operation is 114 cows. The average number of beef cattle per operation is 144 head. Most of the dairies are located on or have access to the 24,677 acres of watershed pastureland or the 5,732 acres of grazed woodland. However, continuous grazing without pasture management practices and waste treatment systems is the common practice. Inadequate waste handling facilities also occur in holding areas where cattle are held for transporting, medication, and other activities.

c. Poultry – Poultry production is by far the highest agricultural revenue generating enterprise within the watershed. In 2000, the farm-gate value for poultry operations was over $8.3 million. This despite the fact there are only 4 poultry operations that exist in the watershed, which produce approximately 1,608,750 birds annually. All poultry operations within the watershed are broiler operations. Most operations do not have facilities to handle and dispose of the waste being produced. Additionally, there are 150 poultry houses in Lamar and Monroe Counties, but outside the watershed, which transport and apply broiler litter to fertilize pasture and hayland inside the watershed.

4. Non-Agricultural Economy:

a. Recreation/Tourism - Tobesofkee Creek and Lake Tobesofkee are significant sources of water-based recreation in the region. Lake Tobesofkee is an important part of the region's tourism industry.

Based on Bibb County estimates, there are approximately 250,000 visits annually for recreational use to Lake Tobesofkee. Based on these figures, Lake Tobesofkee recreation generates approximately $4.5 million annually for the area.

Recreation related businesses on Lake Tobesofkee include marinas, boat sales, tour and entertainment boat operations, groceries, service stations, restaurants, motels, and convention facilities. There are recreational boat loading sites, commercial boat docks, camping and recreational parks located on the Lake.

Camp Kaleo is a unique 318-acre wilderness camp facility within the watershed, which is owned by the Georgia Baptist Convention. It is primarily used to serve as a summer youth camp. However, it has become popular as a rustic conference facility as well.

b. Real Estate - Macon's expansion into the project area is having an effect on real estate values. It is conservatively estimated that there are over 117 houses located on Lake Tobesofkee, and hundreds more in subdivisions that border the Lake. Land values average $208,300 per property and 30 percent higher [$269,000] for lakefront property. Within the watershed itself, land is averaging $1,400 per acre for agricultural uses.

c. Source Drinking Water - Lake Tobesofkee supplies water through 2,300 water meters for 6,210 residents in Monroe County at an estimated rate of 1.05 million gallons per day. A large percentage of rural homes in the watershed rely on individual wells for water. These wells are not contaminated by excessive nitrates or other pollutants being addressed by the watershed plan.

PRESENT AND FUTURE LAND-COVER AND USES:

1. Land Cover-Use:

Figure 2. Land Cover – Tobesofkee Creek Watershed.

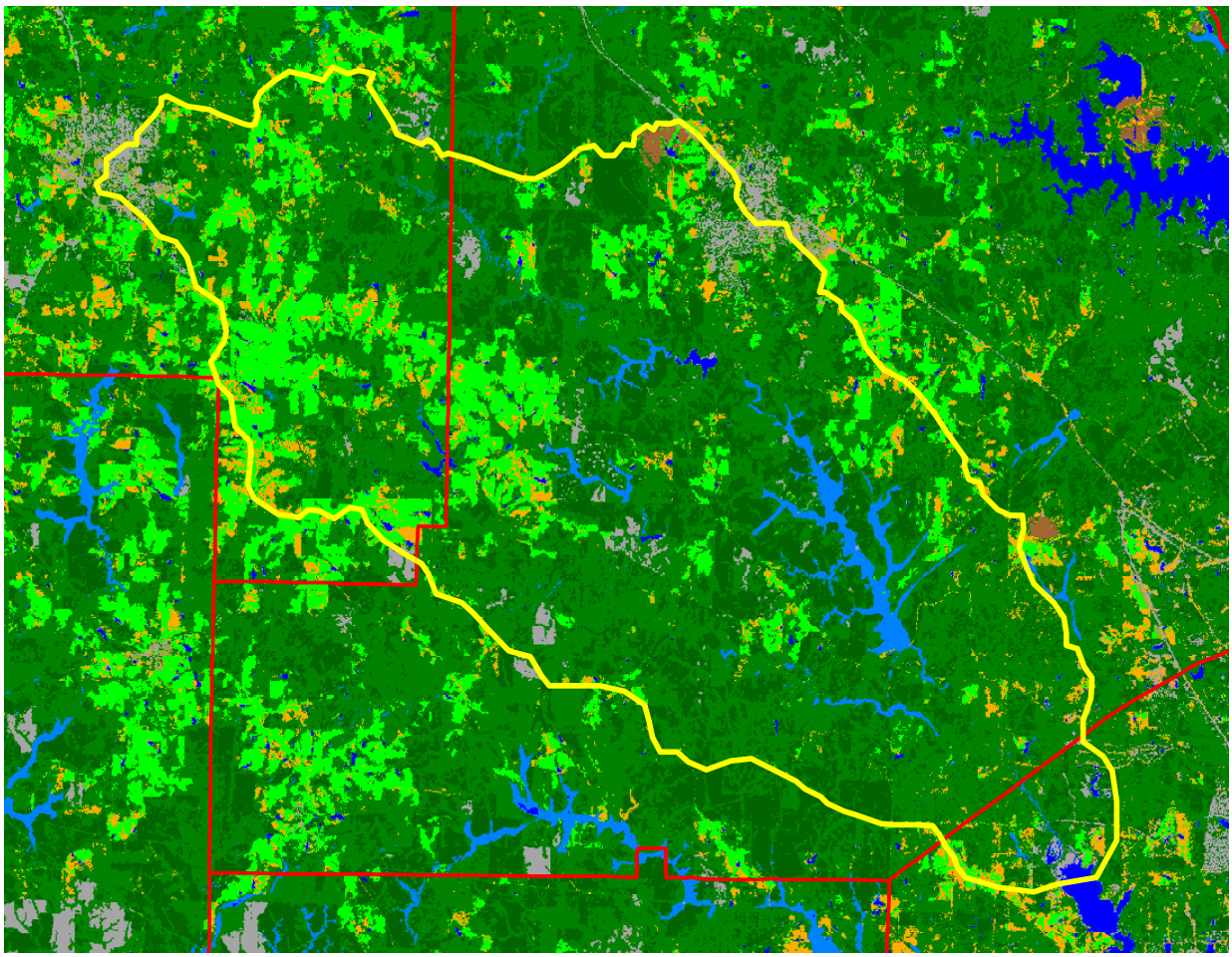


Table B. Tobesofkee Creek Watershed – Land Use.

Land Cover	Acres	Percent
Cropland	9,630	9.5
Pasture	24,677	24.2
Grazed Woodland	5,732	5.7
Hayland	6,566	6.4
Forest	48,866	47.8
Wetlands	2,825	2.7
Open Water	680	0.7
Urban	2,817	2.7
Other Lands	273	0.3
TOTAL	102,076	100

Source: USDA-Natural Resources Conservation Service.

a. Agricultural Lands

Agricultural lands account for 46 percent of the watershed's area. Approximately 7 percent of the estimated 9,630 cropland acres is hydric soil and another 90 percent (8,667 acres) is Highly Erodible Land (HEL), while 42 percent of the cropland is on soils that are severe to moderately eroded and the remaining 26 percent is on eroded soils. Currently, no acres have been signed up for conversion from cropland to permanent cover under the Conservation Reserve Program (CRP).

b. Forests

Much of the woodland in the watershed is mixed hardwoods and pine. Oak-Hickory eastern deciduous forests are located in the lower elevations while white pine-upland hardwoods dominate the ridge and mountain areas. Introduced, or non-native, species are also prevalent. Most of the piedmont areas that have been harvested have been re-established in Loblolly pine stands.

c. Future Land Use Trends

The number of farms has dropped dramatically over the past 35 years. Agriculture, however, continues to account some 46 percent of the watershed area. Much of the agricultural land is devoted to pasture.

Urban growth in the metropolitan Macon area is serving as a catalyst for residential development around Lake Tobesofkee. Service sectors of the economy [i.e. shopping, dining, etc.] are also beginning to expand into the watershed to support the increased population around Lake Tobesofkee. Future land use projections acknowledge the potential for continued population growth, and associated development, in the Macon to Atlanta corridor. This growth will have an impact on livestock and poultry numbers, and the management of agricultural operations, in the watershed over the next 25 years. However, it is anticipated that agricultural will continue to be a major land user and viable contributor to the watershed's economy.

2. Population

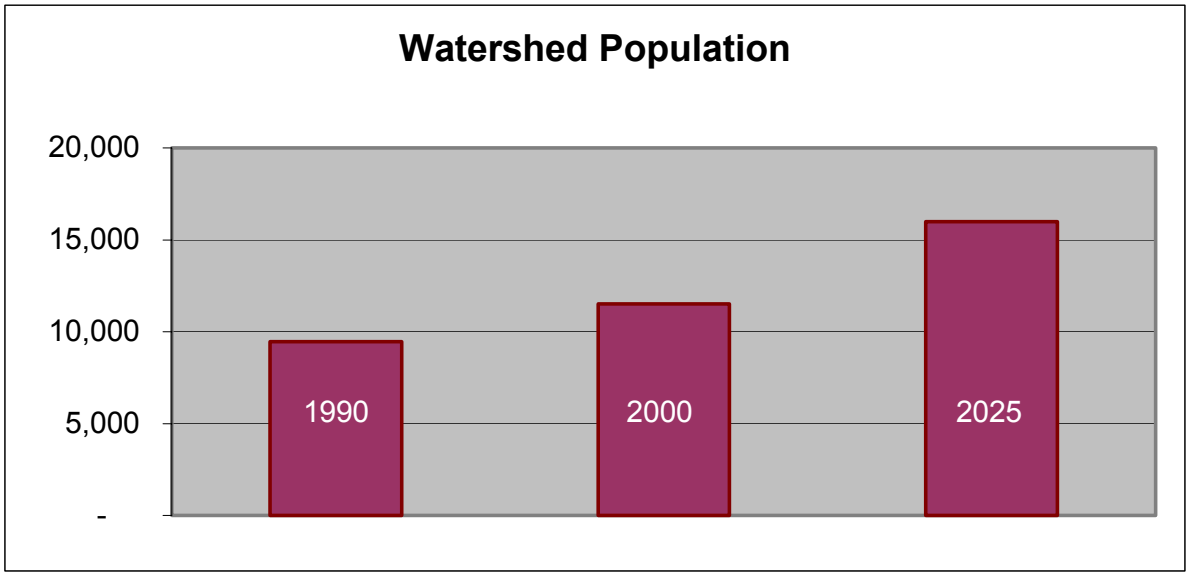
Population has increased significantly in the watershed since 1990 while land has been converted to more urban uses. Population in the watershed is estimated at 11,508 people. The population increased approximately 22 percent between 1990 and 2000. In rural areas, the primary occupation is agriculture with manufacturing and service related industry dominating the urban areas. Population growth, to an anticipated 16,000 residents, is expected in the watershed over the next 25 years.

POPULATION CHANGES

1990	2000	% Change
9,461	11,508	+ 21.64

Source: U.S. Census Bureau

ACTUAL AND PROJECTED POPULATION



Source: U.S. Census Bureau

WATERSHED PROBLEMS AND OPPORTUNITIES

Natural resource problems and opportunities associated with the watershed, which are based on scientific investigations, resource inventories, and public concerns are identified and described. Implementing this plan along with other programs currently in effect and future plans will help solve the agriculture related water quality problems in the region.

1. Watershed Problems Identified by Governmental Agencies

The Tobesofkee Creek Watershed has been identified by local work groups; by the Georgia Wildlife Resources Division; by the Georgia Environmental Protection Division; and by the US Department of Agriculture-Natural Resources Conservation Service [NRCS] as having significant natural resources concerns. Chief among these concerns is the fact that major tributaries within the watershed are impaired, they are not meeting standards for their designated use [i.e. they are polluted].

Water quality problems exist when the intended, or designated, use of the water is denied or impaired because of contaminants in the water. For water quality problems to deny or impair designated use, the water's physical, chemical, or biological properties violate established water quality standards [i.e. are unacceptable]. Table C contains water quality data [Index of Biotic Integrity – IBI and Index of Well Being –IWB] collected by the Georgia Wildlife Resources Division, which required four watershed stream segments to be listed as impaired.

Table C. Water Quality [Biological] Data – Tobesofkee Creek Watershed.

STREAM SEGMENT	IBI	IWB	MACRO-INVERTEBRATE
Cole Creek	Poor	Poor	Poor
Tobesofkee Creek	Poor	Fair	Poor
Tobesofkee Creek – Tributary	V. Poor	V. Poor	V. Poor
Todd Creek	Poor	Poor	Poor

Source: Georgia Environmental Protection Division, Draft TMDL, June 2001

The Georgia EPD estimates that 25 stream miles are impaired on these four stream segments.

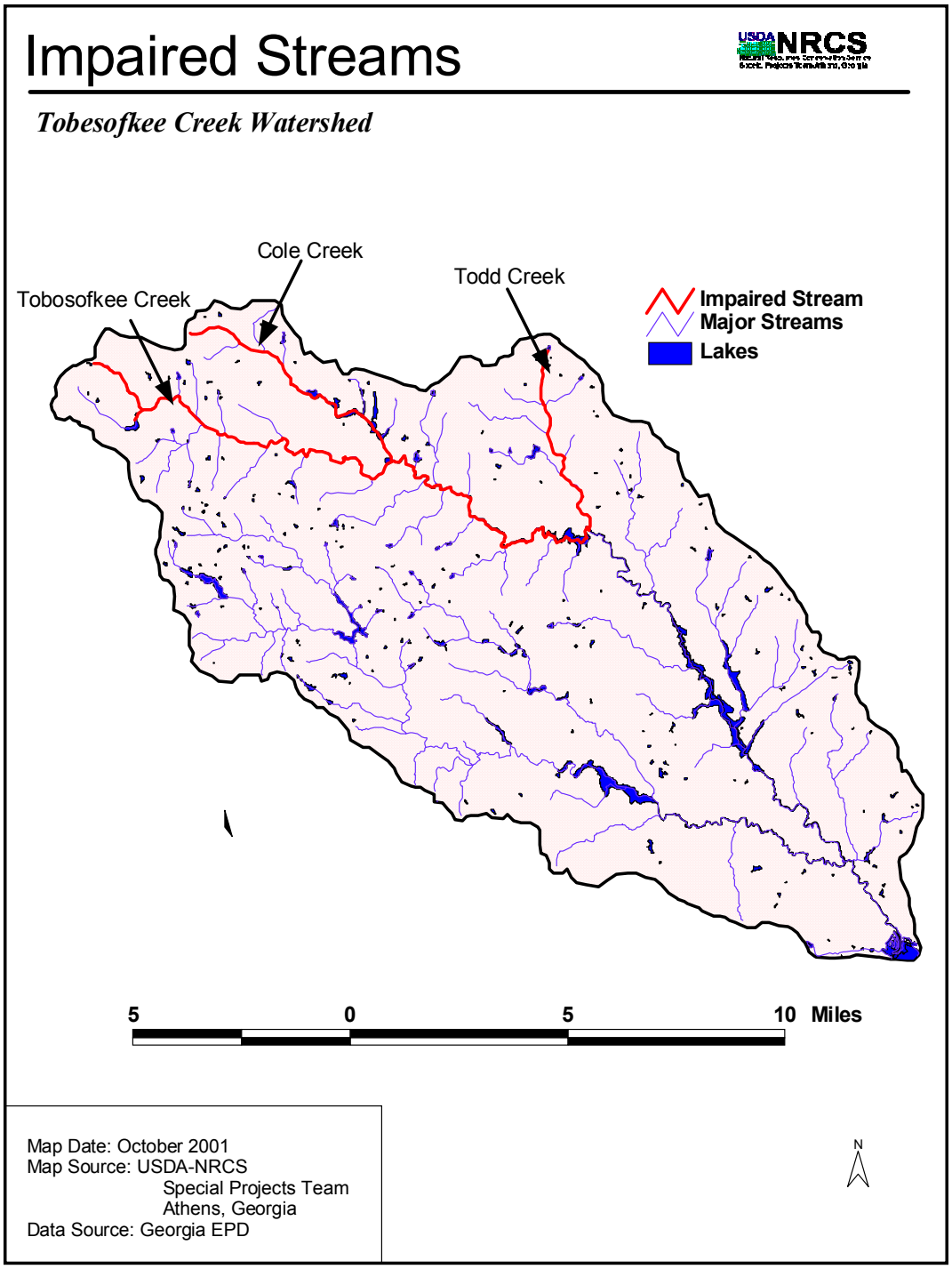
Table D. Impaired Stream Segments – Tobesofkee Creek Watershed.

CREEK	NOT/PARTIALLY SUPPORTING	REASON	EXTENT
Cole Creek	Partially Support	Biological	6 Miles
Tobesofkee Creek	Partially Support	Biological	12 Miles
Trib. to Tobesofkee Creek	Partially Support	Biological	2 Miles
Todd Creek	Partially Support	Biological	5 Miles

Source: Georgia Environmental Protection Division, 303[d] list for year 2000.

While developing a Total Maximum Daily Load [pollutant load limitation] for streams within the watershed, the Georgia Environmental Protection Division estimated that over 85 percent of the water quality impairments stem from agricultural related activities. Left unchecked, continued excessive erosion and sedimentation in the watershed will continue to accelerate water quality degradation, and will have the potential to diminish land productivity, reduce recreational opportunities, impact real estate values, and threaten drinking water capacity for urban areas.

Figure 3. Impaired Streams Segments – Tobesofkee Creek Watershed.



2. Watershed Problems Identified by Local Stakeholders

Landowners and other individuals in the watershed participated in identifying additional natural resource concerns in the watershed. This was accomplished at a public meeting held January 24, 2002. The purpose of this meeting was to provide watershed residents with information collected and published about the watershed's condition by government agencies, and to solicit public input on resource concerns and issues that needed to be addressed during the planning process.

Surface water quality was identified as the highest resource concern of local watershed residents. Much of this concern can be attributed to the Georgia Environmental Protection Division's identification of 25 stream miles within the watershed not meeting their designated use. The resulting four TMDL's, which identified agriculture as a major contributor of stream impairment, provided the impetus for resource concerns associated with agricultural nonpoint source pollution and water quality to also be acknowledged as a major resource concern for the watershed. Specifically, these included sedimentation of watershed streams and ponds, excessive cropland erosion, poor pasture quality, and wetland quality.

Figure 4. Severe Pasture Erosion

Watershed investigations by the Planning Team corroborated these concerns by documenting that severe soil erosion is occurring on cropland and pastureland within the watershed. Cropland within the watershed is eroding at an average rate of 10.26 tons/acre/year; which is greater than 2T [i.e. two-times the tolerance level above which the soils ability to regenerate its productive capacity is diminished]. Pasture erosion is occurring at a average rate of 1.43 tons/acre/year, which is three times that of the state average. Left unchecked, cropland and forage productivity from pastures in the watershed will decrease by 27 percent over the next 25 years without the implementation of this watershed plan.

Figure 5. Stream Sedimentation

Excessively eroding cropland and pasture increase the potential for deposition of sediment offsite and into the watershed streams. Because biological impairments were the water quality criterion violated, which subsequently caused 25 miles of watershed streams be classified as impaired, watershed residents felt that fish and wildlife habitats should be identified as a major resource concern to be considered throughout this planning effort. Biological impairments within the watershed are closely correlated with sediment deposition from upland sources.

Figure 6. Livestock Access to Streams

Many livestock producers recognized the need to exclude livestock from streams and other waterbodies. Therefore, water quantity was a major resource concern for local stakeholders. Realizing that TMDL's, increased regulations associated with Combined Animal Feeding Operations, and future regulatory pressures on agriculture, producers indicated a desire to ensure an adequate supply of good quality water for their animals.

The local public also indicated the need to maintain or improve additional natural resources, including mitigation of the potential for flooding in the floodplain, and improve social and economic opportunities. Social and economic concerns include the need to protect prime farmland, provide for human health and safety, improve local economy, provide recreational opportunities, and improve the community's transportation network. Table E, on the following page, shows results of the initial public meeting held January 24, 2002; the purpose of which was to scope resource concerns within the watershed.

3. Magnitude of Current Watershed Problems

The table below identifies the degree of impact for each area of concern. The degree of impact was determined through public meeting assessments and consensus of interdisciplinary team investigations.

Table E. Significance of Publicly Identified Concerns

Economic, Environmental, Cultural, and Social Concerns	**Degree of Significance to Decision making 1/**
Improve Surface Water Quality [Animal Waste, Ag. Chemicals, etc.]	high
Reduce Sedimentation [Streams, Ponds, etc.]	high
Improve Water Quantity	high
Reduce Cropland Erosion	high
Prevent the Loss of Prime Farmland	high
Protect Human Health and Safety	high
Protect Fish and Wildlife Habitats	high
Enhance Local Economy	high
Enhance Pasture Quality	high
Improve Wetland Quality	high
Protect Property Values	medium
Protect Recreation	medium
Reduce Flooding in Floodplain	medium
Protect Transportation [Roads & Bridges]	medium
Protect Animal Health	low
Maintain Quality of Forest Land	low
Protect Social Well Being	low
Protect Natural and Scenic Areas	low
Maintain Air Quality and Noise	low
Protect Endangered and Threatened Plants & Animals	low
Protect Historic and Cultural Properties	low

1/ High - must be considered in the analysis of alternatives; medium - may be affected by some alternative solutions; low - consider, but not very significant.

4. Inventory and Forecasted Conditions

Historic trends indicate that livestock and poultry numbers, land use and management of agricultural operations in the watershed will have the potential to increase over the projected 25 year evaluation period without strong external incentives and accelerated program opportunities. However, with the likelihood of increased urban influences from Atlanta to the north and Macon to the south, the expected agricultural growth is forecasted as a constant with regard to animal numbers.

The following table identifies current problems and future conditions that are likely in the Tobesofkee Creek Drainage area **without** project treatment for the next 25 years. These projections are based on project land use, water quality modeling, and consensus of Technical Advisory Team Members.

Current Conditions	**Future Conditions**
25 Miles of Streams Not Supporting Designated Use	30 Miles of Streams Not Supporting Designated Use
Cropland Erosion Exceeding 2-T (2 times the tolerable soil loss)	Cropland Productivity Reduced by 27%
Excessive Sedimentation in Riparian Areas	Change of Bottomland Habitat to Drier Land Species
Marginally Adequate Water Supply for Livestock	Few Options for Safe and Plentiful Livestock Water
Limited Potential for Human Health Risk	Increased Potential for Human Health Risk
Game and Fish Habitats Threatened	Loss of Game and Fish Habitats
Pasture Erosion Significant	Opportunity Costs for Forage Production Exceeds 20%
Recreation Activities Contribute Significantly to Local Economy	Recreation Activities and Revenues Decrease by 38%
Real Estate Values are Increasing on Lake Tobesofkee	Real Estate Value on Lake Tobesofkee Decrease by 23% due to increased turbidity

5. Watershed Problem Sources

It is recognized that industrial, municipal, residential and other land uses are major source contributors to the concerns identified. Table G, on page 37, indicates the relative contributions by land use of pollutants to the watershed streams and waterways. However, other local, state, and federal programs will address non-agricultural contributors.

Figure 7. Improper Waste Storage

Through consensus agreement with local, state, and federal natural resources experts, a significant portion of the problem sources could be attributed to agricultural production. From scientific assessment of agricultural operations in the watershed, it was determined that approximately 33,469 tons of animal waste from dairy operations, 139,418 tons of waste from beef operations, 6,544 tons of waste from poultry operations and 4,501 tons of waste from other animal types are generated in the Tobesofkee Creek Watershed annually. This amount of waste contains 1,049 tons of N and 292 tons of P. The waste is primarily generated from 13 dairy, 65 beef and 4 poultry operations. Approximately 6 of the dairy operations, 3 of the beef operations, and 1 poultry operation in the watershed do not have any type of waste management system installed. The remaining 7 dairies, 62 beef, 3 poultry, and 1 swine operation have partial systems that do not adequately handle the waste being produced.

Manure produced by dairy cattle is deposited on poorly maintained pastures. Runoff of animal waste from some dairies is common after rainfall events. Therefore most of the manure is not contained onsite nor utilized properly. Beef cattle congregate in streams and graze on poor quality pastureland while the poultry operations are without adequate systems to store, handle and utilize their waste properly. Commercial fertilizer is currently applied at a rate of 1,747 tons of N and 419 tons of P to cropland and pastures in the watershed, which also contributes nutrients to the watershed streams.

After accounting for natural losses of N and P a combine 2,374 tons of N from animal waste and commercial fertilizer is applied to cropland and pasture within the watershed each year, which is well in excess of the 1,610 tons of N needed. With respect to P, an estimated 623 tons are applied to cropland and pasture each year when the P needed is 191 tons per year. Excess nutrients are transported to rivers, streams, and lakes within the watershed during storm runoff. Some of the N and P is lost to the atmosphere, leaches into groundwater, or is attached to soil particle, which may also runoff during storm events into the watershed's water bodies.

Poor pasture quality, animal access areas and trails, and severe stream bank degradation are also primary contributors of water quality problems. Erosion from cropland and pasture totals 100,986 tons per year. Of this total, 23,304 tons are delivered offsite annually into the watershed streams and wetlands.

Figure 8. Pasture Erosion

Agricultural related problems in the watershed can be grouped into several source areas. These include:

- Eroding pasture and cropland
- Inadequate management and disposal of animal waste onsite.
- Animal access to streams and streambanks.
- Streambank riparian degradation and sedimentation from animal walkways.

Analysis of resource inventory data for the watershed, shows offsite pollutant loadings from agricultural sources to streams and wetlands in the watershed are significant.

Table F. Estimated Agricultural Impact on Streams in the Tobesofkee Creek Watershed.

	Unit	Generated On Farms	Total Deposited into Streams
PASTURE/HAYLAND EROSION (36,965 acres)			
Total Sediment	Tons/yr	44,127	6,620
Nitrogen	Tons/yr	59,251	23
Phosphorus	Tons/yr	106	2
CROPLAND EROSION (9,630 acres)			
Total Sediment	Tons/yr	98,850	29,655
Nitrogen	Tons/yr	68,147	36
Phosphorus	Tons/yr	4745	3
BEEF (12,500 hd)			
Total Sediment	Tons/yr	20,527	1,214
Nitrogen	Tons/yr	833	39
Phosphorus	Tons/yr	222	11
DAIRY (1,500 hd)			
Total Sediment	Tons/yr	4,657	485
Nitrogen	Tons/yr	173	12
Phosphorus	Tons/yr	37	3
POULTRY (268,125 hd)			
Total Sediment	Tons/yr	1,649	4
Nitrogen	Tons/yr	61	1
Phosphorus	Tons/yr	23	0
SWINE (1,200 hd)			
Total Sediment	Tons/yr	465	67
Nitrogen	Tons/yr	27	2
Phosphorus	Tons/yr	9	1
TOTALS			
Total Sediment	Tons/yr	170,275	38,045
Nitrogen	Tons/yr	128,492	113
Phosphorus	Tons/yr	5,142	20

The following table identifies an assessment of total pollutants produced in the Tobesofkee Creek Watershed by producer categories.

Table G. Pollutant Contributions by Land Use.

POLLUTANT SOURCE	POLLUTANT	PERCENT CONTRIBUTION
Industrial/Municipal	Nitrates (NO3)	12
	Ammonia (NH4)	17
	Fecal Coliform	12
	Phosphorus	21
	Heavy Metals	60
	Sediments	5
Residential	Nitrates (NO3)	24
	Ammonia (NH4)	24
	Fecal Coliform	28
	Phosphorus	18
	Heavy Metals	22
	Sediments	6
Farms/Ranches	Nitrates (NO3)	48
	Ammonia (NH4)	43
	Fecal Coliform	55
	Phosphorus	50
	Heavy Metals	8
	Sediments	55
Silviculture/Forestry	Nitrates (N03)	3
	Ammonia (NH4)	3
	Fecal Coliform	0
	Phosphorus	3
	Heavy Metals	5
	Sediments	17
Other/Natural Occurrences	Nitrates (N03)	13
	Ammonia (NH4)	13
	Fecal Coliform	5
	Phosphorus	8
	Heavy Metals	5
	Sediments	17

The above chart reflects estimated loading of nonpoint source pollutants to water-bodies from agricultural sources in the Tobesofkee Creek watershed.

There is 1 municipal/industrial facility (TRIS facility), 0 air facilities, 1 hazardous waste facility, and 0 superfund sites located in the watershed that have Point Source discharge permits as identified by EPA.

6. Watershed Opportunities

Agriculture's role in contributing to water quality impairments within the watershed provides a basis for application of the NRCS Watershed Program. The NRCS Watershed Program was established to assist Federal, State, local agencies, local government sponsors, tribal governments, and program participants to protect and restore watersheds from damage caused by erosion, floodwater, and sediment, to conserve and develop water and land resources, and solve natural resource and related economic problems on a watershed basis. The program provides technical and financial assistance to local people or project sponsors, builds partnerships, and requires local and state funding contribution. Resource concerns addressed by the program include watershed protection, flood prevention, erosion and sediment control, water supply, water quality, opportunities for water conservation, wetland and water storage capacity, agricultural drought problems, rural development, municipal and industrial water needs, upstream flood damages, water needs for fish, wildlife, and forest-based industries, fish and wildlife habitat enhancement, wetland creation and restoration, and public recreation in watersheds of 250,000 or fewer acres. Other sources of pollution within the watershed such as industrial, commercial, and residential is beyond the scope of the NRCS Watershed Program. Other land uses; however, were evaluated in this plan to determine the overall impact of agriculture to water quality problems within the watershed.

The Tobesofkee Creek Watershed Project is part of a comprehensive effort to improve water quality by controlling non-point source pollution and sediment in the Tobesofkee Creek drainage area. Total Maximum Daily Load [TMDL] Implementation activities administered by the Georgia EPD will address issues dealing with industrial, municipal, and residential related problems.

The following is a general list of opportunities that will be realized through the implementation of this watershed plan:

- Compliance with TMDL Implementation Criteria
- Improve Water Quality
- Secure Adequate Supply of Livestock Water
- Increase Cropland and Forage Productivity
- Protect Prime Farmland
- Protect Human Health and Safety
- Improve Fish and Wildlife Habitats
- Enhance Local Economy
- Improve Wetland Quality and Functions
- Protect Real Estate Values
- Protect Recreation Opportunities
- Foster Interagency Coordination for Natural Resources Management
- Augment Ongoing USDA Cost-Share Programs

Quantification of these opportunities is provided in other sections as appropriate.

The Sponsors, along with individual landowners, have shown an interest in developing and carrying out a water quality and watershed protection project in a timely manner. No opposition to the project has surfaced.

Studies and experience in similar watersheds indicate that technical and financial assistance requested by the Sponsor through the PL-566 program is appropriate for solving the soil, water, air, plant, and animal related resource problems in this watershed. The proposed project will improve water quality, reduce the deterioration of the soil resource base, reduce erosion and the resulting sediment, improve wetland and wildlife habitats, and reduce recreational, real estate and transportation impairments. All of the above improvements will enhance the quality of life in the area.

This project will support the Georgia's Nonpoint Source Management Plan to maintain and protect water quality. Maintenance of water quality in agricultural areas is also a high priority of the Georgia Soil and Water Conservation Commission. The project will assist the local community to achieve their goal of protecting the surface and ground water supplies.

SCOPE OF ENVIRONMENTAL ASSESSMENT

1. Introduction

A scoping process was used to identify issues of economic, environmental, cultural, and social concerns in the watershed. Watershed concerns of local citizen were expressed at public meetings and through questionnaires. Factors that would effect soil, water, air, plant, and animal resources were identified by multidisciplinary teams composed of agronomists, biologists, economists, resource conservationists, soil scientists, water quality specialists, and others. The concerns and their degree of significance to the decision making process were identified. A multidisciplinary team composed of various State and Federal agency personnel, conducted an environmental evaluation in January 2002 and provided input into the development of the Environmental Assessment (EA). Water quality, erosion, and aquatic habitat were the major issues identified. Opportunities to reduce water quality degradation and erosion related flooding were targeted for analysis. The following table shows the degree of significance of the concerns identified.

Table H. Significance of Interdisciplinary Identified Concerns

Economic, Environmental, Cultural, and Social Concerns	Degree of Significance to Decision making 1/
Sedimentation [Streams, Ponds, etc.]	high
Surface Water Quality [Animal Waste, Ag. Chemicals, etc.]	high
Cropland Erosion	high
Fish and Wildlife Habitats	high
Water Quantity	high
Pasture Quality	high
Prime Farmland	high
Human Health and Safety	medium
Recreation Opportunities	medium
Wetland Quality	medium
Property Values	medium
Local Economy	medium
Flooding in Floodplain	low
Forest Land	low
Animal Health	low
Transportation [Roads & Bridges]	low
Social Well Being	low
Natural and Scenic Areas	low
Endangered and Threatened Plants & Animals	low
Air Quality and Noise	low
Historic and Cultural Properties	low

1/ High - must be considered in the analysis of alternatives; medium - may be affected by some alternative solutions; low - consider, but not very significant.

2. Wetlands

There are 2,825 acres of wetlands in the watershed. Additionally, there are 680 acres of ponds, streams, and creeks; and 6,839 acres of hydric soils in the project area.

3. Wildlife Habitat

There are 3 woodland wildlife habitat types in the area. These are; oak-hickory upland hardwood, upland pine-mixed hardwood and bottomland hardwood.

The vegetative composition of the various woodland habitat types supports a variety of small wildlife species such as raccoons, opossums, red fox, gray squirrels, cottontail rabbits, various woodpeckers, songbirds and small rodents. Predominant big game species utilizing the area are white tail deer and wild turkey. Raptors include red-tailed, red-shouldered, Cooper's, and sharp-shinned hawks and various owls. There also exists a growing population of black bears middle Georgia.

Open land habitat consists of cropland, abandoned cropland and pasture. There are 9,630 acres of cropland under intensive use for raising cotton, corn, and soybeans and are clean tilled with little or no residue remaining on the soil surface. There are estimated 482 acres of abandoned cropland fields and pastures. These areas are in the first 3 to 5 years of succession, sprouting up with small pines, hardwoods, briers, and wild plum thickets.

Wildlife using the cropland habitats are benefited by the "ecotone" created by the cropland that is adjacent to woodland. The diversification of the abandoned cropland and pasture is creating better conditions for escape, nesting, and resting cover for many species of wildlife, including birds, deer, and small mammals.

4. Fish Habitat

Studies by Georgia Game and Fish biologists indicate the Tobesofkee Creek can support high populations of game fish with good quality water. Tobesofkee Creek and Lake Tobesofkee can also support a very large population of game fish. Fishing in the drainage areas and on the lake has been one of the most popular recreational activities in the area.

There are an additional 680 acres of water contained in streams, small lakes, farm ponds, and natural ponds. Fish populations in these water bodies depend on the degree of management and water quality. The primary native fish species identified in the watershed are bass, brem, shiners, studfish, redhorse, bluegill, and darters.

5. Endangered and Threatened Animals and Plants

The **Federal** list of Endangered and Threatened Species contains the following as occurring in the watershed. These species are listed because of their general ranges of potential occurrence, which includes the Tobesofkee Creek Watershed if suitable habitat is present.

Animals:1/

Bald eagle (T) (Haliaeetus leucocephalus)
Red-cockaded woodpecker (E) (Picoides borealis)
Peregrine falcone (E) (Falco peregrinus0

Plants:1/

Black-spored quilwort (E) (Isoetes malenospora)
Lieelt amphianthus (T) Amphianthis pusillus)

1/ (E) Endangered, (T) Threatened, (S) Threatened due to similarity of appearance of another endangered or threatened species.

6. Cultural and Historical Resources

There are 12 listings on the Historic Register in the watershed. These include the Barnesville Depot, Carnegie Library of Barnesville, Lamar County Courthouse, Redbone Community Clubhouse [location of public meetings for watershed planning], U.S. Post Office – Barnesville, Culloden Historic District, Forsyth Commercial Historic District, Front Circle, Tift College, Great Hill Place, Hil'Ardin/Shar-Hardin-Wright House, Monroe County Courthouse, and Montpelier Female Institute. Historic and prehistoric artifacts are also well distributed throughout the area. Potential adverse impacts on natural and cultural resources will be assessed further, on a field by field basis, during conservation measure plan development prior to implementation.

7. Prime Farmland

There are 27,355 acres of prime farmland in the 102,076 acre drainage area.

FORMULATION OF ALTERNATIVES

The Tobesofkee Creek Watershed project is formulated to bring the watershed's waters back to support their designated uses. The consensus of federal and state water quality specialists involved in the planning process is that if present watershed sediment, bacteria and nutrient levels exported can be reduced by 17 percent from agricultural sources there would be a substantial improvement in water quality. This improvement, would help those waters that do not fully and partially support their designated uses achieve use criteria.

Meeting goals of the Project Sponsors in the Tobesofkee Creek Watershed will reduce sediment, bacteria, and nutrient exports to the Lake by 5 percent. These activities and anticipated funding through ongoing programs should help bring the overall reduction to 21 percent. These cumulative project effects and continued emphasis on nutrient and pesticide management along with a sound conservation program should improve and maintain water quality in the project area as a quality resource over the next 25 plus years.

Preliminary alternatives for solving offsite and onsite problems caused by erosion and animal waste were developed according to the following objectives of the Sponsor:

1. Improve surface water quality to support its designated use by reducing erosion rates to comply with Total Maximum Daily Load [TMDL] recommendations.

2. Decrease the potential for negative offsite impacts from agricultural sources by reducing sediment deposition from agricultural lands and by controlling the amount of nutrients and bacteria from agricultural sources.

3. Improve livestock productivity by securing an adequate supply of good quality water and by improving pasture quality.

4. Maintain the productivity of the soil resource base by reducing excessive erosion damages on pasture and cropland.

1. Formulation Process

Formulation of alternative plans for the Tobesofkee Creek Watershed followed procedures outlined in the NRCS-National Planning Procedures Handbook, NRCS-National Watershed Manual, Economic and Environmental Principles and Guidelines for Water and Related Land Resource Problems, and other NRCS watershed planning policy. Formulation also followed specifications in Technical Note 1706 "Project Planning for Water Quality Concerns, and Technical Note 1801 "Guide for Estimating Participation in Conservation Operations and Watershed Protection Projects".

The formulation process began with the application of an informal indicator survey outlined in Technical Note 1801 "Guide for Estimating Participation in Conservation Operations and Watershed Protection Projects" [TN1801]. The survey was provided to, and completed by, the local NRCS Field Office, Cooperative Extension Agent, Farm Service Agency Representatives, and Soil and Water Conservation District Supervisors. TN 1801 guidance reveals that an estimated participation rate of 50 percent represents a minimum threshold for a viable watershed project. Results of this survey indicate an estimated participation rate of 66 percent for the Tobesofkee Creek Watershed Project. The adequacy of technical, financial, and educational resources at the NRCS Field Office was also assessed and documented.

Given the information that expected participation in the Tobesofkee Creek Watershed warranted a viable project, the next step was to partition agriculture into to discrete units for further evaluation. Evaluation Units were developed for each animal operation type, and were further delineated based upon the adequacy of animal waste treatment facilities. Evaluation Units were also developed for cropland and pasture, and were further delineated to cropland and pasture eligible for the installation of PL-566 conservation measures.

Table I. Evaluation Units

EVAL. UNIT	UNIT CATEGORY	UNIT DESCRIPTION
EU#1	Beef Operations	No System
EU#2	Beef Operations	Partial System
EU#3	Dairy Operations	No System
EU#4	Dairy Operations	Partial System
EU#5	Poultry Operations	No System
EU#6	Poultry Operations	Partial System
EU#7	Swine Operations	Partial System
LU#1	Cropland	Ongoing Program Acreage
LU#2	Cropland	Eligible Acres
LU#3	Cropland	Project Acres [Participation Rate]
LU#4	Pasture	Ongoing Program Acreage
LU#5	Pasture	Eligible Acres
LU#6	Pasture	Project Acres [Participation Rate]

The determination of Evaluation Units is prerequisite to employing the water quality model utilized to assess cause and effect relationships for this project. The water quality model, informally referred to as AWQWA [Agricultural Water Quality Watershed Assessment], is a compilation of NRCS guidance documents [i.e. Technical Note 1706, "Project Planning for Water Quality Concerns, Animal Waste Management Field Handbook, National Engineering Handbook – Section 3, etc.]. Empirical research published by Universities in the southeastern United States also forms the basis of the AWQWA model. The GEORGIA NRCS Special Projects Staff in conjunction developed the AWQWA model with researchers at The University of Georgia, College of Agricultural and Environmental Sciences for application to rural watersheds in Georgia.

An initial run of the AWQWA model, using resource inventory data collected by the Planning Team for this project, identified existing cause and effect relationships between Evaluation Units and water quality within the project area. The model output provides a benchmark condition from which to assess alternative implementation scenarios.

The formulation of alternative implementation scenarios began with a review of all conservation practices in the National Conservation Practice Handbook. Those practices deemed applicable to resource conditions and acceptable to local producers were selected for their relevance. Selected practices were combined into distinct alternatives for the purpose of conforming to a specified planning philosophy expressed by the Project Sponsors. As a result, five alternative plans of action were developed based on their ability to address identified and documented resource concerns, and based on benefit-cost information:

- No Action Alternative
- Minimum Protection Alternative
- Moderate Action Alternative
- Resource Protection Alternative
- Intermediate Alternative

Each alternative, except the No Action Alternative, was designed to follow the complete, effective, efficient, acceptable criteria outlined in the Principles and Guidelines for Water and Related Land Resource Problems.

A Minimum Alternative was developed with a primary focus of meeting the TMDL Compliance criteria of reducing agricultural erosion in the watershed from 3.54 tons/acre to 3.00 tons/acre. Similar treatments of animal waste management systems were evaluated to realize a concurrent reduction of other agricultural nonpoint source pollutants under this alternative.

The Moderate Plan was developed with a primary focus of meeting the TMDL Compliance criteria of reducing agricultural erosion to 3.00 TAY, with additional emphasis being placed on having total suspended solids approach the recommended threshold of 20 mg/L. The Conservation Options Procedure was applied to the Minimum Alternative to identify those combinations of practices that would meet the agricultural erosion threshold.

A Maximum Alternative was developed for the purpose of determining the effect that maximum participation, equivalent to those calculated from TN1801, would have on the watershed's resources. This alternative was deemed to be the Resource Protection [RP] Alternative.

An Intermediate Alternative was developed to meet the TMDL Compliance criteria, and the practical maximum number of resource concerns identified by the public for the watershed area as well as all water quality criteria and recommendations. The Planning Team eventually recommended this alternative to the Project Sponsors as the least cost, most environmentally acceptable, alternative after it was chosen by the public at a May 23, 2002 meeting as the most appropriate alternative.

Conservation land treatment options were developed based on judgement of an interdisciplinary team considering soils, slopes, farm management practices, agricultural trends, and experience gained in planning other projects with similar problems. Total resource management systems were determined based on maximization of net benefits as well as those that address environmental, social, and regional concerns that most closely meet the planning goals of USDA programs. Detailed economic evaluations were used to determine project costs and benefits for the all alternative plans.

2. Description and Effects of Alternative Plans

a. ALTERNATIVE 1 - NO ACTION

Contents: The No Action Alternative consists of implementing the existing EQIP and CRP Programs. Resources under this alternative will be directed to EU's 1,2,3,4,5,6, and 7; and LU's 2 and 5.

It is estimated that land treatment will occur on 231 acres of cropland and 592 acres of pasture over the six-year installation period of this project. Animal waste management practices would be installed on 2 beef operations, 1 dairy operation, 1 poultry operation, and 1 swine operation. Funds will not be sufficient to install adequate Resource Management Systems on any land based or animal operation.

Costs: Total cost - $ 200,000; Gov't share - $150,000; State/Local - $50,000; annual cost - $16,586.

Effects: Without the Project, water quality conditions are forecasted to deteriorate in the watershed. Erosion rates from agriculture will increase beyond the current 3.54 tons/acre, exceeding the TMDL recommendation of 3.00 tons/acre. Riparian buffers will continue to degrade and Total Suspended Sediment [TSS] concentrations in agricultural runoff will increase above the current 36.43 mg/L, which already exceeds The University of Georgia [UGA] recommendation of 20-30 mg/L. Concentrations of nitrogen, phosphorous, and fecal coliform will also continue to exceed water quality criteria and regulatory recommendations.

Conservative estimates indicate that 30 miles of stream segments within the watershed could be impaired at the end of the evaluation period without this project. Additional TMDL's will be established and increased pressures, and regulations, will be placed on producers to comply with water quality standards.

Effects on other resource concerns are also grim under a No Action Alternative. Producers will continue to allow livestock to have free access to streams and water bodies within the watershed. They will come under increased pressure from regulatory organizations and non-governmental organizations to modify this scheme of management. Producers will be forced to install fencing at their own expense for the purpose of mitigating regulatory and social pressures.

Cropland and pasture productivity will continue to decline without the Project. It is estimated that yield potential will decrease by 35 percent on cropland and 20 percent on pastures during the next 25 years. Agricultural producers will continue to struggle in the watershed area, and per capita income is already well below that of state and national averages. Producers will have to absorb increased operating expenses for regulatory compliance on the conservation side of their operation. Several producers will go out of business.

b. ALTERNATIVE 2 – MINIMUM PROTECTION PLAN

Contents: The Minimum Protection Alternative consists of accelerated land treatment on 2,850 acres of cropland and 7,500 acres of pasture. Animal waste management would be provided for 28 animal operations.

Land treatment would include but is not limited to, the installation of cost sharing measures like: critical area planting, grassed waterways, pasture and hayland planting, and use exclusion. Management measures would include conservation cover, conservation crop rotation, cover and green manure crop, nutrient management, pest management, and residue management. Under this alternative, some 19 acres of gullies would be stabilized; 89 stream crossings and 95,995 feet of fencing would be installed.

Animal waste management practices would be installed on 14 beef, 10 dairy, and 4 poultry operations. Measures would include, but not be limited to, waste management system components, waste treatment lagoon or pond, waste utilization system, alternative livestock water supply, fencing, heavy use area protection, diversions/curbing, and stream crossings.

Costs: Total project cost - $1,267,582; PL-566 share - $950,687; Other - $316,896; Annual cost - $132,723.

Effects: Under the Minimum Protection Plan, water quality conditions can be expected to improve. Erosion rates from agriculture will decrease to 3.00 tons/acre, which complies with TMDL recommendations, and was the primary target for this planning effort. Increased vegetative cover on pastures and stabilized cropland will decrease TSS concentrations in agricultural runoff to 25.97 mg/L, which complies with UGA recommendations. Concentrations of fecal coliform will comply with water quality criteria; however, concentration of nitrogen and phosphorus will continue to exceed water quality recommendations.

Productivity of cropland and pasture will be protected by 32 and 34 percent respectively. This will salvage an estimated $305,444 of revenue for producers over the evaluation period.

Producers will have a safe and reliable source of good quality water on 24 livestock operations. This will decrease pressure from regulatory and non-governmental organizations to exclude livestock from watershed streams.

Effects on other resource concerns are also positive under the Minimum Protection Plan. Prime farmland, human health and safety, fish and wildlife habitats, the local economy, wetlands, property values, recreational opportunities, flooding, and transportation networks will all be protected, or enhanced, as a result of this alternative.

c. ALTERNATIVE 3 – MODERATE ACTION PLAN

Contents: The Moderate Action Alternative consists of accelerated land treatment on 3,450 acres of cropland and 7,500 acres of pasture. Animal waste management would be provided for 34 animal operations.

Land treatment would include but is not limited to, the installation of cost sharing measures like: critical area planting, grassed waterways, pasture and hayland planting, and use exclusion. Management measures would include conservation cover, conservation crop rotation, cover and green manure crop, nutrient management, pest management, and residue management. Under this alternative, some 19 acres of gullies would be stabilized; 89 stream crossings and 95,995 feet of fencing would be installed.

Animal waste management practices would be installed on 20 beef, 10 dairy, and 4 poultry operations. Measures would include, but not be limited to, waste management system components, waste treatment lagoon or pond, waste utilization system, alternative livestock water supply, fencing, heavy use area protection, diversions/curbing, and stream crossings.

Costs: Total project cost - $1,481,263; PL-566 share - $1,110,947; Other - $370,316; Annual cost - $184,417.

Effects: Under the Moderate Action Plan, water quality conditions can be expected to improve. Erosion rates from agriculture will decrease to 3.00 tons/acre, which complies with TMDL recommendations, and was the primary target for this planning effort. Increased vegetative cover on pastures and stabilized cropland will decrease TSS concentrations in agricultural runoff to 22.42 mg/L, which complies with UGA recommendations. Concentrations of fecal coliform will comply with water quality criteria; however, concentration of nitrogen and phosphorus will continue to exceed water quality recommendations.

Productivity of cropland and pasture will be protected by 37 and 34 percent respectively. This will salvage an estimated $312,325 of revenue for producers over the evaluation period.

Producers will have a safe and reliable source of good quality water on 29 livestock operations. This will decrease pressure from regulatory and non-governmental organizations to exclude livestock from watershed streams.

Effects on other resource concerns are also positive under the Moderate Action Plan. Prime farmland, human health and safety, fish and wildlife habitats, the local economy, wetlands, property values, recreational opportunities, flooding, and transportation networks will all be protected, or enhanced, as a result of this alternative.

d. ALTERNATIVE 4 - RESOURCE PROTECTION PLAN

Contents: The Resource Protection Alternative consists of accelerated land treatment on 6,324 acres of cropland and 19,969 acres of pasture. Animal waste management would be provided for 54 animal operations.

Land treatment would include but is not limited to, the installation of cost sharing measures like: critical area planting, field borders, filter strips, grassed waterways, riparian buffer establishment, stream bank protection, and use exclusion. Management measures would include conservation cover, conservation crop rotation, cover and green manure crop, nutrient management, pest management, and residue management. Under this alternative, some 387 critically eroding acres and 48 acres of gullies would be stabilized; 225 stream crossings and 243,873 feet of fencing, and 437 acres of buffers would be installed.

Animal waste management practices would be installed on 36 beef, 13 dairy, 4 poultry operations, and 1 swine operation. Measures would include, but not be limited to, waste management system components, waste treatment lagoon or pond, waste utilization system, alternative livestock water supply, fencing, heavy use area protection, diversions/curbing, and stream crossings.

Costs: Total project cost - $6,568,667 PL-566 share - $5,862,535; Other $1,954,178; Annual cost - $818,292.

Effects: Under the RP Plan, water quality conditions can be expected to improve. Erosion rates from agriculture will decrease to 2.26 tons/acre, which complies with TMDL recommendations, and was the primary target for this planning effort. Increased vegetative cover and riparian buffer establishment on pastures and stabilized cropland will decrease TSS concentrations in agricultural runoff to 10.72 mg/L, which complies with UGA recommendations. Additionally, concentrations of nitrogen, phosphorus, and fecal coliform will all comply with water quality criteria and recommendations.

Productivity of cropland and pasture will be protected by 54 and 68 percent respectively. This will salvage an estimated $399,042 of revenue for producers over the evaluation period.

Producers will have a safe and reliable source of good quality water on 40 livestock operations. This will decrease pressure from regulatory and non-governmental organizations to exclude livestock from watershed streams.

Effects on other resource concerns are also positive under the Resource Protection Plan. Prime farmland, human health and safety, fish and wildlife habitats, the local economy, wetlands, property values, recreational opportunities, flooding, and transportation networks will all be protected, or enhanced, as a result of this alternative.

e. ALTERNATIVE 5 – INTERMEDIATE ALTERATIVE

Contents: The Intermediate Alternative consists of accelerated land treatment on 3,450 acres of cropland and 10,347 acres of pasture. Animal waste management would be provided for 38 animal operations.

Land treatment would include but is not limited to, the installation of cost sharing measures like: critical area planting, field borders, filter strips, grassed waterways, riparian buffer establishment, stream bank protection, and use exclusion. Management measures would include conservation cover, conservation crop rotation, cover and green manure crop, nutrient management, pest management, and residue management. Under this alternative, some 206 critically eroding acres and 25 acres of gullies would be stabilized; 120 stream crossings and 129,648 feet of fencing, and 131 acres of buffers would be installed.

Animal waste management practices would be installed on 20 beef, 13 dairy, 4 poultry operations, and 1 swine operation. Measures would include, but not be limited to, waste management system components, waste treatment lagoon or pond, waste utilization system, alternative livestock water supply, fencing, heavy use area protection, diversions/curbing, and stream crossings.

Costs: Total project cost - $2,647,232 PL-566 share - $1,985,424; Other $661,808; Annual cost - $ 329,779.

Effects: Under the Intermediate Plan, water quality conditions can be expected to improve. Erosion rates from agriculture will decrease to 2.85 tons/acre, which complies with TMDL recommendations, and was the primary target for this planning effort. Increased vegetative cover and riparian buffer establishment on pastures and stabilized cropland will decrease TSS concentrations in agricultural runoff to 20.09 mg/L, which complies with UGA recommendations. Additionally, concentrations of nitrogen, phosphorus, and fecal coliform will all comply with water quality criteria and recommendations.

Productivity of cropland and pasture will be protected by 37 and 38 percent respectively. This will salvage an estimated $323,017 of revenue for producers over the evaluation period.

Producers will have a safe and reliable source of good quality water on 34 livestock operations. This will decrease pressure from regulatory and non-governmental organizations to exclude livestock from watershed streams.

Effects on other resource concerns are also positive under the Intermediate Plan. Prime farmland, human health and safety, fish and wildlife habitats, the local economy, wetlands, property values, recreational opportunities, flooding, and transportation networks will all be protected, or enhanced, as a result of this alternative.

The following table identifies the expected effects on resource concerns identified by the local watershed residents for with and without project conditions based on land treatment practices and animal waste systems considered.

Table J. Project Effects on Identified Resource Concerns.

	WITH PROJECT		**WITHOUT PROJECT**	
Resource Concerns	Accelerated Land Treatment	Treatment of Animal Waste	Accelerated Land Treatment	Treatment of Animal Waste
a. Water Quality	+	+	-	-
b. Sedimentation	+	+	-	-
c. Water Supply	+	+	**0**	-
d. Cropland Erosion	+	+	-	-
e. Prime Farmland	+	**0**	-	-
f. Human Health	+	+	-	-
g. Fish & Wildlife Hab.	+	+	-	-
h. Local Economy	+	+	-	-
i. Pasture Quality	+	+	-	-
j. Wetlands	+	+	-	-
k. Property Values	+	+	-	-
l. Recreation	+	+	-	-
m. Flooding	+	**0**	-	**0**
n. Transportation	+	+	-	**0**

(+) favorable impact (-) adverse impact (0) no impact

Table K. Summary and Comparison of Candidate Plans of Action.

Effects (Measures)	ALT 2 Minimum Protection	ALT 3 (Moderate)	ALT 4 (RP)	ALT 5 (Intermediate)
Current = 46,595 acres of eroding cropland and pasture, 65 beef, 13 dairy, 4 poultry, and 1 swine operation without adequate waste handling facilities	Land treatment on 10,350 acres. And installation of 28 animal waste facilities	Land treatment on 10,950 acres. And installation of 34 animal waste facilities	Land treatment on 26,294 acres. Installation of 54 animal waste facilities	Land treatment on 13,797 acres. Installation of 38 animal waste facilities
Project Investment	$1,267,582	$1,481,263	$7,816,714	$2,647,232
NATIONAL ECONOMIC DEVELOPMENT ACCOUNT				
Adverse, Avg. Annual	$132,723	$184,417	$818,292	$329,779
Beneficial, Avg. Annual	$576,714	$871,579	$1,004,434	$946,617
Net Beneficial	$443,991	$687,162	$186,142	$616,838
ENVIRONMENTAL QUALITY ACCOUNT				
Water Quality–Agriculture				
Watershed Erosion Current = 3.54 Tons/Ac./Yr.	3.00 T/A/Y	2.92 TAY	2.26 TAY	2.85 TAY
Total Suspended Sediment Current = 36.43 [mg/L]	25.97 [mg/L]	22.42 [mg/L]	10.72 [mg/L]	20.09 [mg/L]
Offsite Sedimentation. Current = 61,115 Tons/Yr.	45,569 Tons/Yr.	37,608 Tons/Yr.	19,780 Tons/Yr.	33,696 Tons/Yr.
Fecal Coliform Current = 284 [col/100mL]	149 [col/100mL]	125 [col/100mL]	67 [col/100mL]	101 [col/100mL]
Nitrogen & Phosphorus Current = .67/.12 [mg/L]	.40/.06 [mg/L]	.36/.06 [mg/L]	.17/.03 [mg/L]	.36/.04 [mg/L]
Turbidity Current = High Frequency	Reduced Freq.	Reduced Freq.	Reduced Freq.	Reduced Freq.
Erosion – Agriculture				
Cropland Erosion Current = 98,850 Tons/Yr.	67,302 Tons/Yr.	62,254 Tons/Yr.	46,270 Tons/Yr.	62,254 Tons/Yr.
Pasture Erosion Current = 38,933 Tons/Yr.	29,788 Tons/Yr.	29,788 Tons/Yr.	15,692 Tons/Yr.	24,539 Tons/Yr.

Table K. Summary and Comparison of Candidate Plans of Action [Cont'd].

Effects (Measures)	ALT 2 Minimum Protection	ALT 3 (Moderate)	ALT 4 (RP)	ALT 5 (Intermediate)
Threatened and Endangered Species				
Current = Negative impact on aquatic habitats	Positive impact on aquatic habitats	Positive impact on aquatic habitats	Positive impact on aquatic habitats	Positive impact on aquatic habitats
Prime Farmland				
Current = Risk of conversion to other land uses	Protection of 10,350 acres of prime farmland.	Protection of 10,950 acres of prime farmland.	Protection of 26,294 acres of prime farmland.	Protection of 13,797 acres of prime farmland.
Air Quality				
Current = Some odor problems near beef, dairy, and poultry operations.	Reduced odor problems	Reduced odor problems	Reduced odor problems	Reduced odor problems
Wetlands				
Current = Adverse impact on 2,316 acres of wetlands.	Positive impact on 2,316 acres of wetlands.	Positive impact on 2,316 acres of wetlands.	Positive impact on 2,316 acres of wetlands.	Positive impact on 2,316 acres of wetlands.
OTHER SOCIAL EFFECTS ACCOUNT				
Cultural Resources				
Current = Potential damage to unidentified cultural resources	Reduced potential adverse impact on cultural resources	Reduced potential adverse impact on cultural resources	Reduced potential adverse impact on cultural resources	Reduced potential adverse impact on cultural resources
Visual Quality				
Current = Moderate impairment to visual quality	No impairment of visual resource	No impairment of visual resource	No impairment of visual resource	No impairment of visual resource

Table K. Summary and Comparison of Candidate Plans of Action [Cont'd].

Effects (Measures)	ALT 2 Minimum Protection	ALT 3 (Moderate)	ALT 4 (RP)	ALT 5 (Intermediate)
Limited Resources Farmers				
Current = Approximately 7 limited resource producers impacted Current = Approximately 7 limited resource producers impacted	Positive impact to limited resource producers	Positive impact to limited resource producers	Positive impact to limited resource producers	Positive impact to limited resource producers
Health				
Current = Potential health related problems from nutrients, bacteria, and chemicals in ground and surface waters	Reduced potential for health related problems	Reduced potential for health related problems	Reduced potential for health related problems	Reduced potential for health related problems
REGIONAL ECONOMIC DEVELOPMENT ACCOUNT				
Positive Effects, Average Annual				
Region	$374,864	$566,526	$652,882	$615,301
Rest of Nation	$201,850	$305,053	$351,552	$331,316
Negative Effect, Average Annual				
Region	$86,270	$119,871	$531,889	$214,356
Rest of Nation	$46,453	$64,545	$286,403	$115,423

3. Risk and Uncertainty

The occurrence of 2-10 year storm events immediately after installation of land treatment measures and application of animal waste could temporarily impair surface water quality and reduce the effectiveness of the proposed measures in controlling soil erosion and nutrient runoff.

The risk and uncertainty of landowner participation in the installation, operation, and maintenance of such practices and systems is a concern. The benefits and costs of proposed measures are computed at a specific rate of landowner participation and are based on the assumption that practices and systems installed will be properly maintained throughout the life of the project (25 years). However through public participation efforts and criteria in NRCS Technical Note 1801 it was estimated that the rate of landowner participation will be 66 percent for land treatment and animal waste management systems in the Recommended Plan. If the percentages are not obtained or the measures are not operated and maintained properly, the project benefits and costs will be reduced.

4. Rationale for Plan Selection

The Intermediate Alternative was developed to comply with TMDL Implementation criteria and practically accommodate the maximum number of resource concerns identified during the initial scoping process of the first public meeting held January 24, 2002. When compared against the No Action, Minimum Protection, Moderate, and Resource Protection Alternatives; the Intermediate Alternative was judged to be the more acceptable alternative in a May 23, 2002 public meeting, and subsequently recommended to the Project Sponsor. The Intermediate Alternative was also the least costly alternative to meet water quality standards and recommendations.

The Intermediate Alternative meets the Sponsor's objectives of reducing nutrients, bacteria, and sediments entering the streams and recharge areas. Project Sponsor’s endorsed the Recommended Alternative and, thus, it became the Selected Plan. This plan approaches the resource protection alternative in maintaining productivity and environmental quality benefits. The Selected Plan reasonably maximizes net economic benefits. The Plan includes all eligible Evaluation Units (EU’s 1, 2, 3, 4, 5, 6, and 7 and LU’s 3 and 6). No other treatment alternatives, that were complete and acceptable, were identified for these evaluation units.

CONSULTATION AND PUBLIC INVOLVEMENT

Since the 1980's, citizens within the Tobesofkee Watershed have recognized increasing water quality issues and potential problems related to agriculture. Landowners utilized assistance through EQIP to address their concerns, but were limited by program policy and budget constraints. Meetings were held to evaluate the problem and determine if the issues warranted application for additional federal assistance through the PL-566, Small Watershed Program. Based on data obtained and interest within the watershed, the Districts (Sponsors) and NRCS agreed that this watershed should be targeted for special water quality improvement efforts. The Sponsor(s) submitted an application on September 27, 2001 to the Georgia Soil and Water Conservation Commission for NRCS planning assistance under the PL-566 authority. The Commission approved the application and gave it high priority.

To facilitate consultation and public involvement in the Tobesofkee Creek Watershed Project, a project organizational structure was developed. It consisted of the Project Sponsors, who were supported by an Interdisciplinary Planning Team, a Technical Advisory Group, and Stakeholder Involvement.

1. Project Sponsors:

At the initiation of the planning process, meetings were held with key farmers and District representatives from the watershed area to discuss problem identification, conservation systems and PL-566 requirements. Meetings were held on 9/27/01, 02/08/02, and 06/06/02 to make decisions regarding feedback obtain from the Planning Team, Technical Advisory Group, and the Public. To publicize this planning effort and project development, a public announcement was made to local, state and federal agencies by letter and to local landowners through local newspapers and radio to announce the planning start of this project.

2. Public Participation:

A public meeting was held on January 24, 2002 to scope the problems and concerns and to explain impacts of the program in relation to the identified concerns. An overflow crowd of approximately 75 concerned citizens, landowners, and partners attended the meeting. Support was unanimous for continued development of the PL-566 Land Treatment project to help protect the area's natural resources.

Another public meeting was held on May 23, 2002 to explain possible alternative solutions, cost sharing, and the alternative plans of action. The purpose of this meeting was to select one of the alternatives. Through a voting process, the Intermediate Alternative was selected as the most complete, acceptable, efficient, and effective plan for the watershed.

3. Planning Team:

An Interdisciplinary Planning Team provided for the "technical" administration of this project. Technical administration includes tasks pursuant to the NRCS nine step planning process, and planning procedures outlined in the NRCS-National Planning Procedures Handbook. Examples of tasks completed by the Planning Team include, but are not limited to, Preliminary Investigations, Resource Inventorying, Analysis of Resource Data, Formulating and Evaluating

Alternatives, and Writing the Watershed Plan and Environmental Assessment. Data collected from partner agencies, databases, landowners, and others throughout the entire planning process, were evaluated at formal Planning Team meetings held on 10/09/01, 11/6/01, 12/12/01, 02/14/02, and 04/22/02. Informal discussions amongst the planning team, partner agencies, and landowners were conducted throughout the entire planning period.

4. Technical Advisory Group:

A Technical Advisory Group was developed to aid the Planning Team with the planning process. The following organizations were involved in the development of this plan and provided representation on the Technical Advisory Group:

- Lamar County Soil and Water Conservation District
- Towaliga Soil and Water Conservation District
- City of Barnesville, Georgia
- City of Forsyth, Georgia
- Lamar County Board of Commissioners
- Monroe County Board of Commissioners
- Middle Georgia Regional Development Center
- McIntosh Trail Regional Development Center
- Middle Georgia Cattlemen's Association
- Georgia Soil and Water Conservation Commission
- Georgia Forestry Commission
- Georgia Farm Bureau
- Georgia Rural Water Association
- Georgia Department of Natural Resources, Environmental Protection Division (EPD), Water Protection Branch
- Georgia Department of Natural Resources, Wildlife Resources Division (WRD), Game and Fisheries Management Sections
- Georgia State Historic Preservation Officer (SHPO)
- The University of Georgia, Cooperative Extension Service (UGA)
- United States Environmental Protection Agency (EPA)
- USDA, Farm Services Agency (FSA)
- USDA, Natural Resources Conservation Service (NRCS)
- USDA, US Forest Service (FS)
- USDI, Fish and Wildlife Service (F&WS)

A meeting with the Technical Advisory Group was held on January 15, 2002 to determine the influence of agricultural activities on natural resource concerns in the watershed. Real estate valuation figures were acquired through interviews with respective real estate agents in the watershed. This information was used to calculate current and future conditions in the watershed.

A second Technical Advisory Group meeting was held May 14, 2002 to reveal and discuss water quality modeling outputs, review and document NEPA concerns, and explain possible alternative solutions. Input from the Technical Advisory Group provided for improved water quality modeling and assurance of compliance with the Environmental Assessment.

5. Plan Review and Development:

A Drafted version of the Intermediate [Selected] Watershed Plan and Environmental Assessment [EA] was submitted to the Project Sponsors, Planning Team, and Technical Advisory Group. Comments from individuals participating with these groups were incorporated into a final draft plan, which was then sent to the Georgia State Clearinghouse for formal Interagency Review. A Federal Register Notice was developed and published to advertise the Draft Plan and EA, along with a Finding of No Significant Impact [FONSI]. After a 45-day review period, comments received were incorporated into the Final Watershed Plan and Environmental Assessment.

SELECTED PLAN

1. Purpose and Summary

The Selected Plan (Intermediate Alternative) provides technical and financial assistance to accelerate installation of 38 animal waste management systems installed to reduce non-point source pollution from 13 dairy, 20 beef, 4 poultry, and 1 swine operation, and accelerated measures to control pastureland and cropland erosion on 13,797 acres. Over the 6-year implementation period, 13,797 acres by PL-566 and 3,430 acres by CRP and EQIP of excessively eroding pastureland and cropland will be protected from erosion damages.

Installation of the Selected Plan will promote rural economic development; increase local sales tax revenues and income; provide employment; and reduce the amount of agricultural pollutants reaching the watershed streams and Lake Tobesofkee. It will also reduce erosion; maintain the productivity of the soil resource base; and reduce sediment reaching watershed streams, lakes and wetland areas.

The plan will be implemented through the Memorandum and Supplemental Memorandum of Understanding (MOU) and Project Agreement between the NRCS and the sponsoring Soil and Water Conservation Districts. Animal waste systems and land treatment measures will be installed through long-term contracts (LTC) between qualifying landowners or operators and the District. These contracts will be developed during the installation period from 2002 through 2008.

PL 83-566 funds amounting to $1,668,424 will be available on a cost share basis to project participants for installation of animal waste management systems and accelerated land treatment practices. The cost share rate is 75 percent federal and 25 percent local for installing enduring or permanent practices.

2. Measures to be Installed

Ongoing programs will treat only 2 dairy, 12 beef and 1 poultry operations and 963 acres of crop and 2,467 acres of pasture in the watershed over the next 25 years. Non project actions will have only a small impact on alleviating the major animal waste and cropland and pasture erosion problems. This project will provide adequate technical and financial assistance to help treat 38 animal operations and 10,347 pasture acres and 3,450 cropland acres eligible under PL-566 criteria.

The District, supported by the NRCS through the MOU and Project Agreement, will provide administrative and technical assistance in the development of conservation plans and application of conservation practices. Landowners will make the final decision on land use and practices to be installed; however, assistance will be provided only when it contributes to the identified project objectives and does not result in significant adverse impacts. Participation in the program is voluntary. Through public participation efforts and criteria in NRCS Technical Note 1801 it was estimated that the rate of landowner participation will be 66 percent for animal waste management systems and land treatment for the Selected Plan.

Conservation plans will be developed to install the recommended animal waste management systems and land treatment practices. These systems and practices will reduce pollution, protect the soil resource, and complement the landowners' farming operations. The conservation technical staff will make a field evaluation upon the owner/operators request to assess problems and assign fields to the proper evaluation units. Evaluation Units form the basis for deciding which conservation treatment measure will be applied on a particular treatment unit.

Evaluation Units 1 & 2 consists of animal waste management systems for 65 beef operations averaging 150 cows with a partial, or no system for managing animal waste. Resource Management Systems will include, but not be limited to, the following conservation practices, or their components:

- Fencing
- Heavy Use Area Protection
- Livestock Exclusion
- Livestock Watering
- Nutrient Management
- Prescribed Grazing
- Watering Ramp for Cattle
- Stream Crossing

Evaluation Units 3 & 4 consist of animal waste management systems for 13 dairy operations averaging 100 cows with a partial, or no system for managing animal waste. Resource Management Systems will include, but not be limited to, the following conservation practices, or their components:

- Fencing
- Livestock Exclusion
- Livestock Watering
- Manure Transfer
- Nutrient Management
- Prescribed Grazing
- Waste Management System
- Waste Storage Lagoon
- Waste Storage Pond
- Watering Ramp for Cattle
- Stream Crossing

Evaluation Units 5 & 6 consist of animal waste management systems for 4 poultry operations averaging 60,000 birds per flock with a partial, or no system for managing animal waste. Resource Management Systems will include, but not be limited to, the following conservation practices, or their components:

- Mortality Facility
- Nutrient Management
- Waste Storage Facility

Evaluation Unit 7 consists of animal waste management systems for 1 swine operation averaging 1200 hogs with a partial system for managing animal waste. Resource Management Systems will include, but not be limited to, the following conservation practices, or their components:

- Fencing
- Manure Transfer
- Nutrient Management
- Waste Management System
- Waste Storage Lagoon
- Waste Storage Pond

Land Unit 3 consists of 6,324 acres of eligible cropland. Resource Management Systems will include, but not be limited to, the following conservation practices, or their components:

- Conservation Cover
- Conservation Crop Rotation
- Cover and Green Manure Crop
- Critical Area Planting
- Filed Borders
- Filter Strips
- Grassed Waterways
- Grasses and Legumes Rotation
- Nutrient Management
- Pest Management
- Residue Management
- Riparian Forest Buffers

Land Unit 6 consists of 14,826 acres of eligible pasture. Resource Management Systems will include, but not be limited to, the following conservation practices, or their components:

- Critical Area Planting
- Forage Harvest Management
- Nutrient Management
- Pasture and Hayland Planting
- Riparian Forest Buffers

Practices or systems other than those listed above that provide either equal or greater benefits are permitted. However, cost sharing will be limited to the amount based upon established average costs and the percent as indicated in the Watershed Agreement section. Watershed funds may be used for conversion to permanent grass or trees. All enduring practices or combination of practices listed in Section IV of the Georgia NRCS Field Office Technical Guide are eligible alternatives as long as they provide equal or greater benefits. Erosion reduction targets are defined in the Georgia NRCS Field Office Technical Guide for resource management systems. Technical and financial assistance will be limited to areas where they contribute to project objectives and do not result in adverse impacts to identified concerns.

3. Mitigation

Upon outcome of Cultural Resource consideration in the planning process, mitigation may be required.

4. Permits and Compliance

No permits will be required on conservation practices installed on pasture and cropland areas, which are owned or controlled by individual land users.

TMDL Compliance is expected on four watershed stream segments. EPD is responsible for TMDL Implementation. Representatives from EPD participated on the Technical Advisory Group and have commended this planning effort as a vital component of TMDL Implementation in the watershed area. Individual producers are not required, at this point, to follow any specific criteria for TMDL Compliance; however, installing treatment measures outlined in the Selected Plan will mitigate any potential for regulatory action.

With respect to animal operations, the Georgia Environmental Protection Division, Water Protection Branch [EPD], in cooperation with the Georgia Department of Agriculture, promulgates and enforces rules and regulations associated with animal feeding operations and National Pollution Discharge Elimination System [NPDES] Permits. New and expanding animal operations must comply with a variety of rules prior to operating or expanding their facility. Stipulations for animal operations are based on the size of the facility. Requirements can include, but not be limited to, registering the operation with EPD, obtaining a LAS [Land Application System] Permit, and conducting on farm water quality monitoring. EPD and the Georgia Department of Agriculture recognize, and recommend, NRCS conservation practices for all animal operations. Treatment measures outlined in the Selected Watershed Plan will assist producers attempting to comply with animal feeding regulations.

5. Costs

The estimated project installation costs appear in Table 1 on page 65. This includes the cost of land treatment practices and animal waste management systems for which financial assistance, technical assistance and project administration will be provided.

PL 83-566 funds amounting to $1,668,424 will be available on a cost shared payment basis including $812,463 and $855,961 for animal waste management systems and accelerated land treatment measures, respectfully. Cost sharing will be based on one of the four methods outlined in Title 120, Part 404, Subpart D of the NRCS General Manual. The average cost method will be used unless actual cost data can be obtained.

The average cost list will be developed by local USDA agency and district personnel and approved by the NRCS State Conservationist prior to installation. These costs will be reviewed annually by the NRCS State Economist and updated if significant increases or decreases are found. Alternative practices may be substituted if the same or greater level of protection is achieved. Payment will be based on the average cost of the substituted practices and will be limited to the amount, which would have been paid in the selected plan. Cost sharing on a long-term contract (LTC) is limited to a total of $100,000 of PL 83-566 funds for work with an individual, family, corporation or a combination of these where the party has a mutual interest.

The NRCS will provide technical assistance for the design, layout, and installation of appropriate land treatment and animal waste management systems as determined in the individual conservation plans and as identified in the LTC's. All practices will be designed, constructed and maintained according to NRCS standards and specifications. The cost of NRCS technical assistance is estimated at $250,264.

The State Soil and Water Conservation Commission, represented Districts, and counties in the watershed are expected to continue funding employees to provide technical assistance during the project installation for an estimated $83,421.

The NRCS and District will provide an estimated $66,737 and $22,246 respectively, for project administration. Project administration costs are the costs associated with contract administration, providing government representatives when necessary and inspection services during installation of conservation measures to ensure compliance with design plans and specifications. It includes follow-up assistance during the maintenance period. The total project cost of $1,985,424 is for protection of water, air, plant, animal, and soil resources within the watershed and offsite downstream of the watershed.

In addition to the installation costs, there will be operation, maintenance and replacement costs (OM&R) that will be incurred by participating landowners and operators. These costs will primarily be for maintaining and replacing components of the water disposal systems and animal waste facilities. Average annual OM&R costs are estimated to be $153,683

The average annual costs of the project are shown in Table 4 on page 66. Project costs and benefits were discounted and amortized at an 6.125 percent interest rate for the 25-year evaluation period to arrive at average annual figures. The total average annual cost is $329,779.

6. Summary of Cost Share Rates

NRCS will provide financial assistance in the form of cost sharing with landowners on permanent practices. Annual or management type practices are not eligible for cost sharing under PL-566. Cost Share Rates, as allowed by policy, were established based on the Ongoing Program Rate for the area. The watershed is included in the statewide EQIP resource concern area for which the cost share rates is established at a 75 percent federal and 25 percent local. The following summarizes the conservation measures identified in the Selected Plan that are eligible for cost share and their cost share percentages:

Conservation Measure	Cost Share Percentage	
	Local	PL83-566
Land Treatment Practices	25	75
Animal Waste Management Systems	25	75

7. Installation and Financing

a. General - This section describes the responsibilities of the Sponsor, NRCS, and program participants for installing and financing the project. Table K, on page 67, depicts the schedule for obligation of funds and installation of project measures. The installation period of structural practices is planned for six years.

b. Installation - All works of improvement will be installed in accordance with applicable state and federal laws. Waste generated by livestock enterprises may exceed the amount of land controlled by the operator. In these cases, waste management plans may be developed that allow for changing cropping systems for better nutrient utilization or spreading excess waste on neighbors' farms with an acceptable agreement.

During installation, equipment will not be allowed to operate when conditions are such that soil erosion, water, air, and noise pollution cannot be satisfactorily controlled. Burying, burning, or hauling will accomplish disposal of clearing waste and construction debris. Vegetation will be established immediately following construction on all land disturbed by construction activities. Appropriate plants for erosion control and wildlife habitat will be selected based upon the installation season, soils, surrounding vegetation, and landuser's preference.

c. Responsibilities - The NRCS will provide technical assistance to the Sponsor for determining participant eligibility, conducting soil surveys, developing conservation plans, and designing and installing planned animal waste management systems and land treatment practices. NRCS will also provide funds for cost sharing on the waste management systems and land treatment measures through the Sponsors. NRCS will certify completion of practices. The Sponsors - Lamar County and Towaliga Soil and Water Conservation Districts - will be responsible for the following:

- administering the program,
- accepting applications and setting priorities,
- developing contracts and providing adequate technical assistance to the producers,
- issuing payments to participants for completed practices,
- reviewing overall program at least quarterly to ensure proper development of measures,
- reviewing and handling contract violations as needed,
- coordinating with other USDA and State programs, and
- consulting with the U.S. Fish and Wildlife Service if listed species are found within the project area.

The program participants will be responsible for the proper installation, cost documentation, operation, maintenance and replacement of project measures identified in the conservation plan and the long-term contract for the duration of the contract.

d. Contracting - The Sponsors will enter into project agreements with NRCS for installation of project measures. The project agreements are the fund obligating documents that provide funds for cost-share payments. The planned project measures are to be installed under provisions of long-term contracts between landowners, or operators, participating in the program and the Sponsor. Animal waste management systems will be included in long-term contracts that deal with animal waste problems. The contract periods will be not less than 3 years and not more than 10 years. All cost-share practices must be completed within 8 years to allow for 2 years of maintenance. No long-term contract will be signed until the initial participation requirements are met. All LTC's must be signed within 5 years of the date on which the plan is approved.

The participants will be subject to repayment of cost-share payments (or portions thereof) should he/she fail to properly operate and maintain the conservation practices during the expected life span as determined by NRCS and documented in the Field Office Technical Guide.

e. Real property and relocations - All project measures will be installed on property controlled by the participating landowners; thus no additional land rights will be needed. There will be no relocation involved with installation of the project measures.

Table L. Obligation of Funds and Installation of Project Measures Schedule.

YEAR	MEASURE	PL-566 FUNDS	OTHER FUNDS	TOTAL
2003	Conservation Systems	$ 250,283	$ 83,428	$ 333,710
	Technical Assistance	$ 37,525	$ 12,508	$ 50,033
	Project Admin.	$ 10,007	$ 3,336	$ 13,342
	TOTAL	$ 297,814	$ 99,271	$ 397,085
2004	Conservation Systems	$ 417,138	$ 139,046	$ 556,184
	Technical Assistance	$ 62,541	$ 20,847	$ 83,388
	Project Admin.	$ 16,678	$ 5,559	$ 22,237
	TOTAL	$ 496,356	$ 165,452	$ 661,808
2005	Conservation Systems	$ 417,138	$ 139,046	$ 556,184
	Technical Assistance	$ 62,541	$ 20,847	$ 83,388
	Project Admin	$ 16,678	$ 5,559	$ 22,237
	TOTAL	$ 496,356	$ 165,452	$ 661,808
2006	Conservation Systems	$ 333,710	$ 111,237	$ 444,947
	Technical Assistance	$ 50,033	$ 16,678	$ 66,710
	Project Admin.	$ 13,342	$ 4,447	$ 17,789
	TOTAL	$ 397,085	$ 132,362	$ 529,446
2007	Conservation Systems	$ 166,855	$ 55,618	$ 222,473
	Technical Assistance	$ 25,016	$ 8,339	$ 33,355
	Project Admin.	$ 6,671	$ 2,224	$ 8,895
	TOTAL	$ 198,542	$ 66,181	$ 264,723
2008	Conservation Systems	$ 83,428	$ 27,809	$ 111,237
	Technical Assistance	$ 12,508	$ 4,169	$ 16,678
	Project Admin.	$ 3,336	$ 1,112	$ 4,447
	TOTAL	$ 99,271	$ 33,090	$ 132,362
GRAND TOTAL		**$1,985,424**	**$661,808**	**$2,647,232**

Price Base: 2002

f. Other Agencies - No federal agencies other than the Natural Resources Conservation Service have any responsibilities in carrying out this plan.

g. Threatened and Endangered Species – Specific sites have not been selected and will be evaluated on a case-by-case basis. However, if any listed species or suitable habitat for these species occur within a proposed site, surveys for listed species will be conducted by qualified personnel. Also, surveys for listed plants will be conducted during the fruit and flowering time periods and the results of the on-site survey(s) forwarded to the Georgia Ecological Services Field office. Consultation under section 7 of the Endangered Species Act of 1973 will be initiated if species are likely to be affected by the proposed action.

h. Cultural Resources - The treatment areas will have the potential for some surface disturbance with the installation of grassed waterways, diversions and animal waste management systems. Since application for eligible fields have not been received nor practices or locations of practices determined, the State Historical Preservation Officer (SHPO) and NRCS, representing the Sponsor, have developed the following methodology. NRCS personnel will do a preliminary cultural resource reconnaissance after applications are submitted. Potential sites, as indicated by surface litter, will be marked and numbered on quadrangle sheets and a corresponding information form provided by the SHPO will be completed. The information will be provided to the SHPO or their agent to determine initial significance. If their recommendation warrants follow-up actions, a determination of significance and/or eligibility, confirmation procedures will be initiated. If significant cultural values are discovered during construction, the participants will be advised to notify the State Historical Preservation Officer and the Secretary of the Interior (through the appropriate field office of the Interagency Archaeological Services Division) in accordance with GM 420-401.

In accordance with Section 3 of Public Law 93-291, NRCS will take action to protect or recover, or both, any significant cultural resources discovered during construction.

i. Financing - Federal assistance for carrying out this plan will be provided under the authority of the Watershed Protection and Flood Prevention Act (Public Law 83-566) as amended. This assistance will be subject to appropriations from Congress. Local financing will come from the individual participants and the Sponsor.

j. Operation, Maintenance, and Replacement - Each long-term contract will provide for the operation, maintenance, and replacement (OM&R) of included measures. The participating landowners or operators will be responsible for OM&R activities and obtaining materials needed to ensure that each project measure performs its intended functions.

Contracts with landowners will specify that all practices will be maintained for at least two years after installation of all required conservation treatment to assure full implementation of the long-term contract. Following this two-year period, participants will be responsible for continuing maintenance and providing timely replacement as needed to maintain a reasonable level of OM&R throughout the practice life. NRCS or the District's technical representative may inspect the practices at any reasonable time during the period that the long-term contract or agreement is in effect.

Table 1. Estimated Installation Costs – Tobesofkee Creek Watershed.

EVALUATION UNIT			ESTIMATED COST 1/ PL-566 NRCS 2/	Other Than PL-566	TOTAL
Animal Waste Unit	Amount				
1	No.	26	$ 272,835	$ 90,945	$ 363,780
2	No.	3	$ 12,060	$ 4,020	$ 16,080
3	No.	7	$ 224,768	$ 74,923	$ 299,691
4	No.	6	$ 185,769	$ 61,923	$ 247,692
5	No.	1	$ 31,667	$ 10,566	$ 42,223
6	No.	3	$ 57,231	$ 19,077	$ 76,308
7	No.	1	$ 28,133	$ 9,377	$ 37,510
Subtotal			$ 812,463	$ 270,821	$ 1,083,284
Land Treatment	Unit	Amount			
3	Ac.	3,450	$ 685,631	$ 228,554	$ 914,175
6	Ac.	10,347	$ 170,330	$ 56,775	$ 227,105
Subtotal			$ 855,961	$ 285,319	$ 1,141,280
TECHNICAL ASSISTANCE			$ 250,264	$ 83,421	$ 333,685
PROJECT ADMINISTRATION			$ 66,737	$ 22,246	$ 88,983
TOTAL PROJECT COST			$1,985,424	$ 661,808	$ 2,647,232

1/ Price Base 2002
2/ Federal Agency Responsible for Installation of Works of Improvements

Table 4. Estimated Average Annual Costs – Tobesofkee Creek Watershed.

EVALUATION UNIT	Installation Costs 1/	Operation, Maint. and Replacement 1/	TOTAL 1/
Animal Waste			
1	**$ 28,797**	**$ 42,843**	**$ 71,640**
2	**$ 1,273**	**$ 2,239**	**$ 3,512**
3	**$ 23,724**	**$ 45,316**	**$ 69,040**
4	**$ 19,607**	**$ 39,842**	**$ 59,449**
5	**$ 3,342**	**$ 4,066**	**$ 7,408**
6	**$ 6,041**	**$ 6,504**	**$ 12,545**
7	**$ 2,696**	**$ 6,033**	**$ 9,002**
Land Treatment			
3	**$ 72,366**	**$ 5,479**	**$ 77,845**
6	**$ 17,978**	**$ 1,361**	**$ 19,339**
TOTAL	**$ 176,097**	**$ 153,683**	**$ 329,779**

1/ Price Base 2002, Amortized over 25 years at a discount rate of 6.125%

Table 5A. Estimated Average Annual Watershed Protection and Damage Reduction Benefits – Tobesofkee Creek Watershed.

	Damage Reduction Benefits [Average Annual Dollars] 1/	
ITEM	**Agricultural Related**	**Non-Agricultural**
Offsite/Public		
Recreation		
Real Estate		**$ 592,329**
Sub-Total		**$ 592,329**
Onsite		
Waste Utilization		
Reduced Production Costs	**$ 216,116**	
Long Term Productivity		
Crop Production	**$ 113,372**	
Forage Production	**$ 24,800**	
Sub-Total	**$ 354,288**	
TOTAL	**$ 354,288**	**$ 592,329**

1/ Price Base, 2002

Table 6. Comparison of Benefits and Costs – Tobesofkee Creek Watershed.

Evaluation Unit	Damage Reduction Benefits (DOLLARS 1/) Agricultural	Non-Ag.	Average Annual Benefits	Average Annual Costs 2/	Benefit Cost Ratio
Animal Waste					
1	$ 129,722	$ 216,964	$ 346,736	$ 71,640	4.84:1.0
2	$ 5,638	$ 9,426	$ 15,065	$ 3,512	4.29:1.0
3	$ 61,239	$ 102,385	$ 163,624	$ 69,040	2.37:1.0
4	$ 54,067	$ 90,394	$ 144,461	$ 59,449	2.43:1.0
5	$ 2,163	$ 3,616	$ 5,778	$ 7,408	0.78:1.0
6	$ 5,352	$ 8,949	$ 14,301	$ 12,545	1.14:1.0
7	$ 7,176	$ 11,998	$ 19,174	$ 9,002	2.13:1.0
Land Treatment					
3	$ 68,759	$ 114,957	$ 183,715	$ 77,845	2.36:1.0
6	$ 20, 122	$ 33,641	$ 53,763	$ 19,339	2.78:1.0
TOTAL	**$ 354,288**	**$ 592, 329**	**$ 946,617**	**$329,779**	**2.87:1.0**

1/ Price Base 2002
2/ From Table 4

Table M. Effects of the Selected Plan on Resources of Principal National Recognition.

Types of Resources	Principal Sources of National Recognition	Measurement of effects Resource Gain or Loss
Air Quality	Clean Air Act, as amended (42. U.S.C 1857b. et seq.)	**Gain**. Adverse Odors from animal waste near animal operations will decrease
Areas of particular concern within the coastal zone.	Coastal Zone management act of 1973, as amended (16 U.S.C. 1451 et seq.).	**No Effect**
Endangered and threatened sp. critical habitat	Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.).	**Gai**n. Protection of aquatic habitats
Fish and Wildlife habitat	Fish and Wildlife Coordination Act (16 U.S.C. Sec. 661 et seq.).	**Gain**. Reduction in associated agricultural nutrients in habitat areas
Floodplains	Executive Order 11988, Flood Plain Management	**Gain**. Wooded floodplains and riparian buffers restored with conservation practices
Historic and cultural properties	National Historic Preservation Act of 1966, as amended (16 U.S.C. Sec 470 et seq)	**No Expected Effect**
Prime and unique farmland	CEQ Memorandum of August 1,1980; Analysis of Impacts on Prime or Unique Agricultural Lands in Implementing the National Environmental Policy Act	**No Effect**
Water quality	Clean Water Act of 1977 (33U.S.C. 1251 et seq.)	**Gain**. Water quality in streams and groundwater will improve by reducing sediment and animal waste nutrients from the problem area.
Wetlands	Executive Order 11990, Protection of Wetlands Clean Water Act of 1977 (42 U.S.C 1857h-7, et seq.).	**Maintain**. Wetland areas will be maintained and improved by reduction of sediment and protection of wetlands.
Wild and scenic rivers	Wild and Scenic Rivers Act, as amended (16 U.S.C. 1271 et seq.).	**No Effect**

REFERENCES

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LIST OF PREPARERS

GEORGIA NRCS STAFF	Title	Education	Experience
Jimmy Bramblett	Water Res. Specialist	B.S., M.S, Ag. Economics Univ. of Georgia Athens, Georgia	2 yrs. Ag. Economist 6 yrs. Res. Conserv. 3 yrs, Water Res. Specialist
Carmen Westerfield	District Conservationist	B.S.A. Agronomy Univ. of Georgia Athens, Georgia	2 yrs, Soil. Conserv. 13 yrs. District Conserv.
Eunice Graham	Lamar/Upson County Soil Consv. Technician		
Carolyn Toman	Monroe County Soil Con. Technician	B.A. Education, Tift College Forsyth, Georgia M.Ed. – Education Georgia College Milledgeville, Georgia	
Carol Oliver	Soil Consv. Technician	B.S. Biology	
William Taylor	Area Resource Conservationist	B.S. M.S. Agronomy Ft. Valley State Ft. Valley, Ga.	20 yrs. Soil Conserv. 12 yrs. Res. Conserv.

SOIL AND WATER CONSERVATION DISRTICTS

Jim Ham	Chairman, Towaliga Soil and Water Conservation District
Walter Greiger	Chairman, Lamar County Soil and Water Conservation District
Tom Aiken	District Supervisor, Lamar County Soil and Water Conservation District
Jack Walter	District Supervisor, Lamar County Soil and Water Conservation District

TABLES

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APPENDIX A

Letters and Oral Comments

During the 45-day public and interagency review period nine reviewers provided 89 comments on the draft Watershed Plan and Environmental Assessment. The vast majority of comments were to improve spelling and grammar in the draft. One comment identified errors in the mathematical tables displaying economic information.

Another comment included several suggestions on reformatting the draft to avoid redundancy. However, the format of this document follows the prescribed format of the NRCS-National Watershed Manual.

No opposition to the plan surfaced during the planning process, or during the public and interagency review period.

APPENDIX B

Investigation And Analysis

General

The overall plan development was guided by NRCS's National Watersheds Manual as amended December, 1992, and associated Circulars No. 1, 2, and 4. It is recognized that other sources contributing land uses such as industrial, commercial, and residential are not evaluated in this plan. However, their percent impact on the overall problems identified in the watershed was calculated out from the overall watershed evaluation to determine the impact for agriculture. It is assumed that if substantial offsite impacts are linked to these sources, appropriate actions and solutions will be taken to help protect natural resources in the watershed. Their treatment is beyond the scope of the PL-566 program.

Land Use

Present land use in the watershed was determined from Natural Resources Conservation Service Field Office records, meetings with local agricultural workers, National Resources Inventory (NRI) 1997, Multi-Resolution Land Cover 1994 (EPA), and regional and local statistical data from state and local commissions and agencies. NRCS also performed a cropland erosion assessment on a site-specific basis for all cropland in the watershed.

Future land use is based on good land management, the intentions of local landowners and trends in land use as recognized by agricultural leaders and workers within the watershed area. Historic trends indicate that crop rotations, livestock, and poultry numbers, land use and management of agricultural operations in the watershed could change significantly over the next 25 years.

Animal Waste Options

Technical Note 1706,"Project Planning for Water Quality Concerns", was used as a guide together with the NRCS Engineering Handbook-Agricultural Waste Management Field Handbook in developing and evaluating alternative animal waste management systems.

Alternative systems were developed considering the functions of each system component used in the production, storage, treatment, transfer and utilization of animal waste. Multi-systems were derived considering these functions and the associated components that would enable a complete and efficient system to be installed. Consideration for the acceptability and practicality of each system for the local landowners was determined and those systems that did not meet the criteria were deleted from further consideration. The Project Engineer, District Conservationist, and Extension Agents supplied the cost estimates.

Land Treatment Options

The practices or conservation systems considered under the watershed project were compared, where applicable, to the ongoing programs, or EQIP and CRP programs. For example, critical area treatment and riparian buffers were used in the waterways with pasture and hayland planting on the pasture areas. The erosion and sediment reduction is approximately 21 percent over present conditions. By comparison, the selected watershed plan will approach "T" values for the soils. All practices and systems will be installed according to NRCS standards and specifications applicable at the time of the agreement date.

NRCS, FSA, Soil and Water Conservation Commission, district personnel, together with local farmers, helped develop a list of potential practices and estimated costs. All practices available in NRCS's National Conservation Handbook were reviewed for consideration.

Forestry

A systematic field survey by the NRCS in consultation with the Georgia Forestry Commission personnel assessed ground cover, forest and hydrologic conditions, excessive erosion, and treatment needs. The recommended measures help reduce flooding, stabilize soil, and reduce offsite sediment problems.

Fish and Wildlife

The NRCS Biologist and interdisciplinary team made several watershed reconnaissance visits and visited with local and regional parks, game and fisheries personnel to establish the fisheries, fishing and hunting pressure, wildlife abundance and habitat and problems in those arenas.

Rare, Threatened, and Endangered Species

An NRCS biologist and members of the planning team made a literature search and a field reconnaissance of the watershed. They confirmed the potential for presence of some listed species in the event of suitable habitats and recognized likely habitat for many others. Following this finding an interagency planning team scoped problem area sites to determine the impact of project actions on threatened and endangered species and determined that proposed measures would not impair their habitats. A list of the threatened and endangered species is found in the Scope of the EA section of the Plan.

Wetlands

The 1997 NRI database and Multi-Resolution Land-Cover geographic information database made a wetland survey possible for the watershed counties. Additional field checks will be made in determining eligibility. The maps and checks will be consulted when developing implementation plans and long term contracts.

Geology and Sedimentation

The geologic investigation consisted of a study of literature and maps pertaining to the area and a field reconnaissance. The watershed area is covered by published soils maps, USGS quad sheets, multiple USGS and Georgia Geological Survey Bulletins and recent aerial photography. Procedures established in the NRCS National Engineering Handbook (NEH-3) were followed. Erosion values and sediment yields were established for all major land uses.

Economics

The economic analysis was conducted in accordance with procedures outlined in the NRCS National Watersheds Manual, the NRCS Economics Handbook, and the Water Resource Council's Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies. The formulation and evaluation of this project is consistent with the federal objective of contributing to national economic development while protecting the nation's environment. All alternative project plans were formulated to alleviate environmental problems, while maximizing economic development.

All basic data used in the investigation and analysis of this project was obtained from interviews with local farmers and agricultural workers, publications from the U.S. Department of Agriculture, the University of Georgia's College of Agricultural and Environmental Sciences, and from the interdisciplinary planning team members.

Animal waste treatment measures were selected following an economic evaluation of all viable alternatives. Each recommended option was selected based on cost efficiency, greatest net benefits, and other non-monetary factors. Onsite benefits included utilizing the waste on pasture, hayland, or cropland for fertilizer. Crop and livestock data reported by the Georgia Agricultural Statistics Service and information compiled by the NRCS Special Project's Team Water Quality Specialist were used to estimate the total volume of waste produced. Evaluation units were established using the size of operations and treatment methods as the grouping criteria. Land treatment options considered erosion factors affecting pasture and cropland.

The selection of the recommended project measures was determined by following the Conservation Options Procedures (COP). The COP procedure was used to determine the cost effectiveness of conservation practices and combinations of practices, the quantification of net benefits and the costs of the alternatives identified as being cost effective.

All benefits of the alternative plans were calculated using the difference in the value of goods and services available "with the project" and their values "without the project". The onsite agricultural benefits were determined by subtracting gross returns without treatment from gross returns with treatment and then adding the reduction in variable production costs.

Offsite benefits attributable to offsite sediment reduction and water quality improvements were determined from interdisciplinary meetings and interviews with state, city, and county officials. Damages were based on impacts to area water resources. All benefits and costs are average annual figures for the evaluation period (25 years). The tables on the following pages show the procedures used for calculating the average annual equivalents over the evaluation period.

Practices and Resource Management Systems for the Selected Plan

The eligible cost shared practices, units and cost per unit used in formulation.

Land Treatment Practices	**Unit**	**Cost($)**
Pasture and Hayland Planting (512)	10,347 ac.	100/ac.
Critical Area Planting (342)	206 ac,	1,300/ac.
Field Borders		
Filter Strips (393)	131 ac.	186/ac.
Riparian Forest Buffers (391)	131 ac.	230/ac.

Non-cost shared practices, units and cost per unit used in formulation.

Conservation Tillage	3,450 ac.	30/ac.
Conservation Cropping Sequence	3,450 ac.	10/ac.
Crop Residue Use	3,450 ac.	10/ac.
Nutrient Management	13,797 ac.	10/acre
Pesticide Management	13,797ac.	10/ac.
Waste Utilization		

Animal Waste Management Practices	**Unit**	**Cost($)**
Waste Management Systems (312)		
Diversions/Curbing (362)	2,100 ft.	2.47/ft
Fencing (382)		
Cross		
Electric	7,600 ft.	.75/ft
Barbed Wire	30,400 ft.	1.10/ft
Exclusion		
Electric	7,600 ft.	.75/ft
Barbed Wire	30,400 ft.	1.10/ft
Heavy Use Protection Area (561)	192,000 sqft.	1.00/sqft
Irrigation Water Conveyance (430-DD)	21,000 ft.	3.20/ft
Irrigation Sprinkler System (442)	14 no.	2,600 ea.
Pumping Plant for Water Control		
includes appurtenances (533)	14 no.	9,500 ea.
Composting Facility (317)	4 no.	16,800 ea.
Waste Storage Structure (313)no.		
Stack Facility	4 no.	24,000 ea.
Waste Storage Pond /Lagoon		
(New)	7 no.	10,000 ea.
(Upgrade)	6 no.	4,100 ea.
Stream Crossings (728)	120 no.	1,885 ea.
Roof Runoff Mgt. (558)	14 no.	264 ea.
Trough or Tank (includes pump) (614)		
Watering	120 no.	1,900 ea.
Flush System	14 no.	3,830 ea.